

The Chemical Age

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Notes and Comments

External Degrees

THE value of a degree gained externally, and generally in a very real sense of the term by burning the midnight oil, was the subject of some general comments in these notes a few weeks ago. The subject has exercised some of our engineering contemporaries since that time primarily because of the decree passed in the autumn of 1931 by the Senate of the University of London that after a certain date steps would be taken to ensure that schools or colleges which were preparing students to sit for the external B.Sc. in Engineering were adequately equipped to give education of the desired standard. Some manifest a desire that the external degree as such should be abandoned. Others, less intolerant, demand that the external man should put the letters "Ex" after his name, evidently regarding him as an outcast, in no way to be compared with the fortunate beings who happen to have had fathers possessing the necessary funds to send them to a University. All stress the need for practical works experience.

The opponents of the external degree base their views on an assumed lack of "education" as distinguished from the possession of knowledge on the part of those who have not been internal students of a University. In the case of a very young graduate there is sound foundation for this argument. In the earlier years of the young man's business or professional career there is upon occasion a very definite distinction in outlook and in that indefinable something which some may perhaps term "manners" or "breeding" between those who have been to the public schools or to the more dignified universities and those who have not. But that distinction, sooner or later, wears off in a large percentage of those in industry.

A Question of Merit

THE purpose of the University training up to graduation should be to give that measure of general education and training which alone will fit a man for the life of the world later. If, as seems probable, there will be more leisure for relaxation, it is all the more important that as many people as possible shall have a University education so that they may make ample use of that leisure. But we maintain that there should be no reason to suppose that those who have graduated are of necessity equipped to enter the professions, or

the workshops of industry. Those desiring to do that should be equipped by post-graduate courses.

In some quarters there is apprehension that the Doctorates are being too easily bestowed to-day. Undoubtedly the Doctorates should only be given for work which the experts recognise as outstanding. In how many instances is this true of the Ph.D.? It always seemed to us a pity to introduce a subsidiary doctorate; and it seemed a pity more than ever to give it just for carrying out a year's experiments suggested and generally controlled by the Professor. A man should contend with the forces of nature on his own initiative before he should be so dignified. Is it wise that University training should have any real bearing on industry? Should not the normal University degree course be taken as a higher form of school work and the entry into industry be governed rather by professional bodies? It would then become right and proper that the higher grades of industrial scientists, whether engineers, chemical engineers or chemists, should have their merits assessed by their technical record as well as by their academic qualifications, and not by such trifling things as the ability to attend a given seat of learning.

The Spirit of Adventure

THERE is a book by a former famous novelist—now alas with us no more—in which an adventurous Englishman is referred to by a Buddhist monk as a "Brother of the Monastery called the World." After a very few years in industry we are all "Students of the university called the World"; the knowledge so painfully acquired during our degree courses, no matter how achieved, soon deserts us. We remember broad general principles, we remember details about our particular job—but the rest fades like an ill-fixed photograph. How many of those now engaged in coal carbonisation and who have left their University, say, five years ago, could fill a sheet of notepaper with what they remember about the alkaloids?

Has not education gone a little mad? We agree that it is deplorable for us to educate thousands of men to degree standard and then to give them no hope of employment. Is not part of the fault that most people consider the University education or the possession of a degree to be sufficient entrée into the chemical or engineering professions, whereas it is but the novitiate for the Monastery called the World. Why must

they who have a B.Sc. degree necessarily consider science as their life's work? The profession of salesmanship, for example, surely the largest calling numerically in the world, would do well to recruit men with scientific knowledge to sell the many things produced in industry which in most instances have a scientific use. A coal owner recently told us how successfully he had employed young men leaving public schools in the sales department. "Why not University men?" we asked. "They won't do it, they consider it beneath them," was his reply. No doubt the University called the World will in time teach them better, but is it not a sad reflection on the value of a University training that the public schools breed a spirit of adventure, whilst the universities do not?

The Successful Chemist

OUR recent note on premium pupils has aroused some little discussion in quarters that are unfortunately inarticulate; we should have valued our readers' views on this important subject. There are two aspects to the question. We purposely omit the third—and highly unsavoury—one of the "chemist" who sets out to augment his income by professing to teach a number of pupils without having any qualifications or possibility of so doing. That form of obtaining money by false pretences is less rare than we could have wished, but is, of course, never practised in the smallest degree by honourable professional men. Given, however, equal ability and fair dealing on both sides the question as to the advisability or otherwise of paying a premium depends upon one's conception of the meaning of the term "success." It is thereon that the two aspects rest.

To some, "success" means the esteem which follows high technical or academic achievement; to others success is measured by business influence, in other words, it can be expressed in terms of money. There are many who would be adequately content with the first kind of success, but for one reason or another the world will not allow them to pursue it. Academic achievement and the growth of knowledge cannot be bought by the payment of a premium. If the University—pre-eminently the place where men teach—cannot impart knowledge, surely no payment of premiums can do so. But, as we pointed out when dealing with the industrial pupil, there is much in another sphere that can be taught by the practising consultant—but it is not knowledge to be lightly bestowed.

Teaching and Consulting Work

WE have before stressed the advisability of keeping the function of teaching and consulting work separate. The only thing that a premium pupil can hope to learn and should learn is knowledge of industrial matters, or the general conduct of a business. If a young man sets out with the idea of becoming a public analyst, or a consulting chemist, then, having taken his degree, he may with great advantage apprentice himself to someone of recognised standing who is carrying on either of these businesses—for however much we may dignify them as "professions" they are businesses run for

profit like any other business—in order to learn "the ropes." Here he will learn how to get business, how to deal with clients, what scale of fees to charge, and, incidentally the best methods of dealing with certain of the more awkward analyses; he will also learn the precautions necessary to enable his results to be accepted in Courts of Law, and how to give evidence. For this the "instructor" is entitled to be paid a substantial fee. Not a mere hundred guineas, but something really substantial. He is giving the knowledge and experience of years and is enabling someone to become a potential competitor. No industrial concern would do such a thing, however large the fee, but the chemical and the medical profession do so. Unfortunately, so many seem to consider that the teaching of a few analytical processes is all that matters.

Safety Matters

IN Horseferry Road, not very far distant from Westminster Abbey, the British Government maintains a museum which is of interest to all users of machinery. Accidents are liable to happen in almost any type of factory, but with adequate precautions they can be reduced to a minimum or completely avoided. Ways and means of doing this will be seen at the Home Office Industrial Museum, where the officials are courteous and ready to assist you. As a taxpayer you are entitled to visit this permanent exhibition of safety devices; as user or owner of machinery you are at liberty to seek advice. It is one of the few Government departments where good service is forthcoming on application, untrammelled by red tape. The adequate protection of moving machinery and power transmission belts is a matter of the utmost importance; cranes and lifting tackle also cause accidents unless they are operated properly and maintained in good working order. Drums, acid carboys and cylinders of compressed gases should be handled with due caution whilst unloading or emptying; safety clips should be fitted to stoneware cocks to prevent the plug from lifting; control valves on plant should be placed in accessible positions so that they can be operated with the least possible delay in an emergency; fire hydrants and extinguishers should be of an approved pattern and placed in convenient positions in the factory so that they are reached without difficulty. These are only a few matters, cited at random, upon which you may seek authentic information. Electrical fittings, wiring and appliances, constitute a special source of danger wherever inflammable vapours are present; in this connection the Home Office also places its valuable experience at your disposal without fee or favour.

Chemists and Publicity

WE are pleased to learn from the Journal of the Institute of Chemistry that the hon. secretaries of the local sections—whose recent conference in London was so useful that it must become an annual event—are increasingly alive to the value and importance of reliable publicity through the medium of the independent technical Press. We imagine they have no patience with petty restrictions on the publication of really useful information, and we shall therefore look forward to hearing frequently from all the provincial sections during the winter session that is now opening.

The British Association Meeting, 1933—(II)

Professor H. E. Armstrong's Impressions

How the B.A. meetings serve to advance science is difficult to discover; they certainly do not advance discovery. They are not taken seriously by the professions. This is specially noteworthy in *Education*, nominally the Section of *Educational Science*, a science which is a non-existent entity, although the Section is over thirty years old. As the putative father of the Section I have feelings on the subject. In the first paper, at the first meeting of the Section in 1901, at Glasgow, Sir John Gorst being in the chair, I said:—

"For the first time, a public platform has been provided on which the subject matter and methods of education can be fully and impartially discussed without reference to personal or political considerations. The Section has been instituted at the instance of a body whose main care hitherto has been the interests of natural science: a body in which humanistic studies have played no part. The Association now invites those to join its ranks who have been accustomed to regard the humanities, if not as the only fit subjects of study, at all events as affording a sufficient basis of a general education; we deny this premise and we ask them to consider fully with us the programme of the future. It is essential that they should be well represented at the meetings—although attendance may demand some sacrifice on their part, just as it does on ours, at the present time. . . . The public will surely expect that when the methods of education are being seriously debated those to whom the care and conduct of education is mainly entrusted shall contribute their full share to the inquiry. They cannot be regarded as such past masters of their art that they can afford to withdraw themselves from the vivifying influences which abound at the meetings of the Association. In fact teachers are all bound to recognise that they are but learners in the art of teaching—that they live in new times and must adopt new practices—and that the public good requires that they should cordially co-operate in introducing the changes which so many see are necessary but which so few can define."

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My hope is unfulfilled. This Section has never yet attracted a representative attendance of teachers; it has never developed a sense of method. At most, now and then, one of those strange beings, peculiar to our country, to whom unobservant and unreasoning parents blindly entrust their children, of the species known as "headmaster," has deigned to occupy the chair but he has never carried even his own staff with him. Giving the presidential address of the Section the second year, in Belfast, I took "imagination" as my theme, ending by saying "Modern progress is based on research—the application of imagination. Surely then there is every reason to make this spirit of research the dominant force in education." The spirit of standstill prevails.

Our schools to-day have less imagination in them than they had 30 years ago; they are in the hands of Erewhonian Straighteners called "certificate examiners"—in whom is not a spark of imagination. The possibilities offered to the Section have neither been appreciated nor has it been scientifically organised; no considered constructive outlook has governed its proceedings. Had the Section been a success, it would have dominated the Association and rendered it effective as an instrument of public instruction. If a Samuel Butler were to arise out of the Slough of Education, he would have ample material for a new *Erewhon*—for that is where we are.

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The single week's programme of the Association is the equivalent of an eight weeks' programme at the Queen's Hall. It differs in having far fewer classical items and is full of odds and ends. There is no "Conductor." It is true, the meeting has a president; he, however, is there merely to pipe his own solo—he should have the right to call the tune of his year. A "Sir Henry Wood" is needed to draft a programme and see it through, with flower in button hole, supported by a first fiddle, first flute, first horn, a big first drum, of course, etc., each distinguished by a Sectional waistcoat, all playing their best. As it is, instead of an orchestra in unison we have an unhappy, unrehearsed team,

—an unmatched crew, each paddling his own canoe, no two rowing together or attempting to follow stroke. If musicians were to present their work in the ragged way in which we present ours, no one would listen. Naturally enough, the Press takes no serious notice of the meetings. In my early day "The Times" had as its chief representative a man of exceptional ability and presence who went everywhere and consulted everyone worth consulting. His considered analysis of the proceedings was full of interest and informative; in addition, the Sectional addresses and discussions were fairly reported. A couple of pages would be given to each day's meeting. Now we only have occasional tit-bits. Four columns for 13 Sections on the first day, three to the death of King Feisal: such is the press of matter, unless it be that editors do see through the emptiness of most of the proceedings, from any public point of view.

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King Feisal's death may have grave political consequences; do the whole of the B.A. proceedings this year count for anything—apart from the Treasurer's evening lecture? Here the Press was caught napping and its lack of generalship made clear. Sir Josiah Stamp's address was not even mentioned by "The Times." That it should not rise to such a minnow—whatever his subject—is surprising. The lecture was the star turn—a challenge to the scientific, experts, especially to men such as Sir Arthur Eddington and Lord Rutherford—the one living outside our world, the other only thinking of smashing the ultimate 'atom; neither giving the least thought to world affairs, which may easily become so bad that there may be little room left for the scientific worker. Already in Germany "Lern und Lehrfreiheit" are abolished. The B.A. will once more be of value only when the proceedings fill the Press.

Sir Josiah Stamp sees, as not a few of us have done, that social development in no way corresponds to the growth of industry under the influence of scientific discovery and invention; in short, that scientific method has yet to be applied to our affairs. One swallow may not make a summer but a repentant sinner may well pave the way to change. The council is to consider the coordination of scientific and social progress. It will be a little difficult for the blind to lead the halt. Not only must the Association be reorganised but the scientific mind must be reconstituted, to fit it for social service.

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The presidential address this year was easily the most significant that has been delivered in modern times. The very few who can sufficiently read between the lines will see in it a wonderful story of progress and hope but over-modestly expressed in the language of a dreamer, if not a mystic. Sir Frederick Gowland Hopkins and I are the oldest of friends; in another place I am his senior Fellow; perhaps, then I understand the trend of his mind better than most. I would liken him to a musical composer; his address to a musical composition, specially produced for the occasion, therefore not a spontaneous work of art but forced upon him by circumstances. Like *Rienzi*, it is a mixture of an old (Italian) style with that of the Wagner that is to be—a kind of "New World Symphony," introducing more or less faintly a variety of popular themes, audible to instructed ears but needing much fuller expression to be caught by the public. Fascinating to the expert, it has a haunting Pelléas and Meliande air of rhythmic melancholy and wistfulness; he would hope if he had the courage but sees the difficulties ahead.

He writes to a great theme—nothing less than the meaning of *Life*. That he should cumber the story with entropy is unfortunate nor was it necessary to dispute with the vitalists, even with a counter address from *Zoology* in view. Zoology, without knowledge of chemistry, has no right to

speak at present; the expression of an opinion becomes meaningless when uninformed.

We expect from Sir Frederick a clear statement of the present evidence. Unfortunately, he gives but a halting disjointed account: even so the story is very wonderful, very chemical. Take the problem of nerve control:—

"It is a familiar circumstance that when an impulse passes to the heart by way of the vagus nerve fibres the beat is slowed or, by a stronger beat, arrested. That is, of course, part of the normal control of the heart's action. Now it has been shown that whenever the heart receives vagus impulses the substance acetyl choline is liberated within the organ. To this fact is added the further fact that, in the absence of the vagus influence, the artificial injection of minute graded doses of acetyl choline so acts upon the heart as to reproduce in every detail the effects of graded stimulation of the nerve. Moreover, evidence is accumulating to show that in the case of other nerves belonging to the same morphological group as the vagus, but supplying other tissues, this same liberation of acetyl choline accompanies activity, and the chemical action of this substance upon such tissues again produces effects identical with those observed when the nerves are stimulated. More may be claimed. The functions of another group of nerves are opposed to those of the vagus group; impulses, for instance, through certain fibres accelerate the heart beat. Again a chemical substance is liberated at the endings of such nerves and this substance has itself the property of accelerating the heart. We find then that such organs and tissues respond only indirectly to whatever non-specific physical change may reach the nerve ending. Their direct response is to the influence of particular molecules with an essential structure when these intrude into their chemical machinery."

It is as if a billiard ball were played at a long string of balls and the distal ball moved off from these to hit others near at hand and so carry a message to them. The activity of muscle seems to be exerted through the successive occurrence of a whole series of electrolytic changes, starting from glucose. The production of bone, the alcoholic fermentation of sugar; all these vital operations are seen to be necessary and final consequences of a succession of chemical changes, each the inevitable consequence of this or that conjunction of simple material agents.

To this we may add the story of the various endocrine excitants, each peculiar to an organ in the animal body; finally, the various accessory food factors active in most minute proportions, yet indispensable.

The president owes his position in the scientific world to these last. He it was who, in 1906-12, first saw their importance. Well may he believe in *Life* having a purely physical-chemical basis, as if it were a succession of electrolytic acts. There isn't much left for the Bishops or even a Haldane to go upon. He fell between two stools—the desire to write an ornate address, in accordance with custom, at the same time make his own knowledge tell. We had looked to him for a new Ride of the Valkyries, carrying triumphantly true foods to the gods, with such loud blast of trumpets that all should hear. To have made his science of public benefit, he should have spoken out definitely and told the simple story of food—what it is known to be and what it should be. Nothing is of consequence to us primarily but food. Having given this out as his theme, he should have instructed the chosen *Thirteen* each to develop the subject in the way proper to his section, specially ordering *Economics* to return to its true function, for which see *Sesame and Lili's*.

The effect upon public opinion might have been magical. A great opportunity has been sacrificed! There is a fast growing tendency to give up natural food. Fresh food is disappearing from the shops; the grocer's shop is a ghastly spectacle of paper packets, tins and bottles. Without family, living in flats or single rooms, what were once called housewives are fast becoming mere parcel openers. *Punch*, as usual dots our i's in saying—"In the old days," writes a clergyman, "every meal was opened with grace but what happens now?" An easy one. It is opened with a tin opener. Hitler is at least right in ordering the woman back to the house. The president spoke, perhaps haltingly, of education for leisure. What is needed is education against laziness, education for work, education to bring science into every home; not in the form of the dust

collector but to sweep away mental cobwebs. Science has failed during the past sixty years to prove that the average man is in any way educable—it must altogether change its methods of attack if it is ever to teach the right way of work—that of leisure will follow.

Let us hope Sir Frederick will continue to study the "*New Atlantis*." The opportunity lies before him to build a Solomon's House out of his own Society. I argued for this at the Australian meeting in 1914. The Royal Society remains a disjointed rabble, utterly selfish in its individual outlook. Until we cure ourselves and show that we can act together, we cannot expect to be called in to help others to cure the ills of society. The Press scoffs at the idea of our coming in as helpers; see, for example, the "*Sunday Times*," of September 17. That there are principles of scientific method that are equally applicable to all is undreamt of by popular writers; they only think of our displayed narrowness. Meetings such as that of the B.A. only serve to justify public suspicion of our value. We but do ourselves to death, so long as we remain divided and unorganised for concerted action on behalf of society. No individual discoveries, no amount of atom smashing, will save us! A definitely synthetic effort is needed.

Whether the Knight of the Purse will be able to stamp a social sense upon the Association is doubtful. At least, he might advise his colleagues in *Economics* as to the meaning of the term *Gold Standard*—if he know. Some use should be made of the collective voice of "Science": to help stay the present criminal treatment of world currencies, by speculative trading in Gold and the consequent lack of a standard: in restraint of Roosevelt 'flations: so that we may not all be forced soon to do as the Gadarene Swine. That the Corpus of Science throughout the world should be voiceless, at such a period of crisis, seems incomprehensible. To what end are two Prime Ministers in our Royal Society? The President, the more because of his Pooh Bah position, has a clear task before him: to hurry on his Solomon's House and effectively link Science with the State.

Hazards in Chemical Works

The Photo Tube

How electricity is being utilised in the prevention of accidents was described to the Chemical Section of the twenty-second annual Safety Congress at Pittsburgh, on October 4, by J. V. Alfriend, of the General Engineering Department of the Westinghouse Electric and Manufacturing Co., of East Pittsburgh, Pa. "We cannot," said Mr. Alfriend, "prevent a man from deliberately walking into danger nor can sufficient guards always be employed to save fingers, hands or arms. But we can disconnect power and apply brakes when a man approaches or enters the danger zone." The photo tube, or electric eye, has made this possible and the development of the Phototroller has made it practical. So long as the photo tube is illuminated nothing happens. The instant anything intervenes between the light source and the tube, cutting off the illumination, the photo tube plate current changes and the circuit operates to open circuit breakers or motor starters, to apply brakes, or to sound warning signals. Likewise, a slight wisp of smoke coming between the light source and the photo tube is sufficient to set up the circuit for the ringing of alarms or the operation of a sprinkler system. The photo tube is the safety engineer's "electric eye," for danger casts its shadow before an injury occurs and the shadow falling on the photo tube can instantly set in motion alarms or corrective measures.

Mr. Alfriend described other protective devices which have been originated to control accident hazards in the chemical industry. One of the most spectacular hazards in the chemical industry is the explosion of gases ignited by electric sparks. To meet this hazard the explosion resisting motor has been developed, explosion resisting starters and push buttons have been devised. Methods have been developed for the protection of workers against live electric circuits. Emergency stop push buttons is another protective device.

Sir George Newman Criticises the Chemical Treatment of Food

Some Methods which Call for Attention and Control

SIR GEORGE NEWMAN, Chief Medical Officer to the Ministry of Health, calls attention in his annual report for 1932* to a new problem which has arisen through the scientific "treatment" of food at the hands of skilled chemists. Every factory of any consequence, he points out, is now equipped with its research laboratory and every sort of artifice is being used to "improve" the appearance, colour, taste, keeping qualities, etc., of food. For the most part such artifices are above suspicion and constitute an obvious advance in manufacturing practice, but many of them are open to serious question and are causing some uneasiness among those responsible for the wholesomeness of food supplies. As instances in which there exists a legitimate suspicion that a commercial process may involve a definite risk to health or debasement of nutritive value Sir George cites (a) the fumigation of food with toxic gases to destroy insect pests, (b) the presence of heavy metals in foods due to the materials or containers used in manufacture and storage, (c) the increasing use of poisonous insecticides and fungicides in agriculture and horticulture, (d) the treatment of flour with bleaching and "improving" agents, (e) "fortification" of foods by artificially added vitamins, (f) the uncontrolled and unregulated exposure of food to ultra-violet rays and (g) the introduction of new synthetic colours and flavours.

Deficiencies in Food

More exact knowledge has now been obtained as to the nature of the various constituents of food and in many cases their identification has led to the artificial preparation of the constituent in question. These artificial products are used to remedy "deficiencies" in foods, or to make it possible for a cheap low-grade article to be given an attractive and high-grade appearance. A particularly interesting case of this is butter. Some types of butter are richer than others in the characteristic "butter aroma." This aroma is due not to the milk fat, but to a product formed by the bacterial cultures used as butter "starters." These bacteria after a time seem to lose their power of producing aroma, so that it is not always easy to secure and maintain a good butter starter. The actual substance responsible for the aroma has been identified as diacetyl. The body first formed by the bacterial culture is acetyl-methyl-carbinol, from which the strongly smelling diacetyl is formed by oxidation. The best dairy butter may contain about 0.0005 per cent. of diacetyl. It can be extracted and approximately determined by distilling it off and converting it into dimethyl-glyoxime, which gives intensely red crystals with a nickel salt.

Diacetyl can readily be made artificially, and a solution of it in water is employed to give aroma to butter deficient in this respect. At first sight it might appear that the question at issue is merely whether the consumer prefers his butter highly flavoured or not. A slight trace of diacetyl (about 5 to 10 parts per million of butter), could hardly be held to constitute a danger to health, especially if, as appears to be the case, diacetyl is a normal constituent of butter. The issue is, however, by no means so simple.

Diacetyl in Butter

Diacetyl is a very reactive substance and exerts a definite oxidising action on fats. It is a well-known fact that highly aromatic butter does not keep well, and that butter for export should be well washed. This washing removes most of the acetyl-methyl-carbinol and diacetyl, thus removing aroma, but at the same time enhancing the keeping quality of the butter. It would seem, therefore, that the addition of synthetic diacetyl to butter to improve its aroma may defeat its own object by causing the butter prematurely to turn rancid. Moreover, the accelerated oxidation brought

about by diacetyl may possibly have some destructive effect upon the vitamin A in butter. If so, the addition of diacetyl may be definitely antagonistic to accepted ideas in nutrition. Even if no adverse effect upon the butter is to be anticipated, it cannot be in the consumer's interest that a food which has been stored and has perhaps deteriorated in some degree, should be so treated by artificial means as to convey the impression that it is absolutely fresh.

Colour in foods is now recognised as being an important factor from the salesman's viewpoint. This is seen more especially in confectionery, where colours used are mainly reds, oranges and yellows associated with different fruit flavours. It is fairly widely known and generally accepted that all these colours and flavours in confectionery, and many of those in preserves, jellies, etc., are artificial, and it is doubtful whether many purchasers are really led to believe that fresh fruit has been used in their manufacture.

Colour Preferences

There is, however, another aspect of colour in food which is of primary importance to the public. For instance, the bleaching of flour may involve the partial destruction of the yellow colouring matter, carotene, which is one of a large family of "lipochromes," yellow and orange fat-soluble colours occurring widely in nature. They are present in all green vegetation, where their colour is masked by the green of chlorophyll. Butter and egg-yolk owe their rich yellow colour to these substances. Carotene has been shown to be a most valuable foodstuff, in that it is probably the primary source from which the body obtains most of its vitamin A, and it is highly probable that the lipochromes of butter and egg-yolk have similar properties. The public knows by long experience the value of butter and eggs, and subconsciously associates the rich yellow colour of certain foods with the presence of butter or eggs.

This preference for a certain colour as indicating superior nutritive value was taken advantage of many years ago by margarine manufacturers, and it was found necessary to impose a rigid system of labelling for margarine. At that time, no doubt, the motive for restrictive action was partly the safeguarding of public health, and partly the protection of agricultural interests, and it is only lately that the public health aspect has become more obvious. Logically the labelling system adopted for margarine should be extended to custard powders, coloured a rich golden-yellow but otherwise consisting only of starch and sugar with a little artificial flavouring material. Egg powders again, possessing the visual appeal of the genuine article, may contain absolutely no egg at all. The public does not understand the subtle trade distinction between "egg powder" and "powdered egg." There is no objection to these articles as wholesome foods, but they are coloured and labelled in such a way as to lead the consumer to believe that he is getting an article of superior nutritive value. There is also a difference in nutritive value between summer and winter butter. The former is strongly yellow due to plentiful grass feeding and it is more nutritious than the pale-coloured butter of stall-fed cows in winter. Normally the consumer would show preference for rich colour as indicating a higher quality of butter, but it is now customary to add artificial colour to winter butter.

Vitamins and Bread

Where the nature of a food does not admit of artificial colour being used as an indication of high quality, the food is often advertised as being of *specially high vitamin content*. Instances abound where the name of the product or its description in advertisement implies the possession of high nutritive properties which have little or no foundation in fact.

There is also a tendency at the present time for manufacturers to avail themselves of the publicity value of recent

* "On the State of the Public Health: Annual Report of the Chief Medical Officer of the Ministry of Health, for the year 1932." H.M. Stationery Office. 4s. net.

vitamin research by adding vitamins empirically to a variety of foods without due consideration of the results which may accrue from such haphazard practices. If a halt is not called to this indiscriminate dosing of foods with vitamins there is a possibility of a disturbance in the balance of nutrition which may have wide-reaching effects and which it is not unreasonable to contemplate with some uneasiness. As an example of this attempt to "improve" the nutritive value of a food (and incidentally its selling appeal to the consumer) the addition of irradiated ergosterol (vitamin D) to bread may be mentioned. Such bread is already on the market and recently an important firm of bakers contemplated the addition of irradiated ergosterol to their bread in amount sufficient to make its vitamin D content equivalent to that of butter, weight for weight. This would mean an unusual ingestion of vitamin D by the consumer when it is considered that many pounds of bread are eaten for each pound of butter consumed.

An Urgent Matter for Control

A further objection is that all consumers of the bread would take the vitamin D which it contained whether they required it or not. The purpose of bread is mainly to supply energy and a certain amount of protein and the quantity of bread in the diet varies in accordance with these requirements. Consequently consumers would not only be compelled to take vitamin D, but would actually have their dose regulated not by their requirements of vitamin D but by their energy requirements. A person doing hard work might easily eat twice the amount of bread which a sedentary person might consume and thus get twice the dose of vitamin D although the vitamin requirements of both persons might be the same and considerably smaller than the amount supplied in the bread to either. It is therefore desirable that the administration of vitamin D should be capable of control and this could certainly not be ensured if vitamin D were continually being administered in a staple daily food like bread which is eaten in varying quantities and the consumption of which is governed by needs entirely different from vitamin D requirements. If the practice of adding irradiated ergosterol to bread became at all general it might become impossible, in some districts at any rate, to obtain ordinary bread free from this substance.

Metallic Poisoning from Cider

A further outbreak of lead poisoning from the drinking of cider was reported in September, from Devonshire. This outbreak was, as in former cases, traced to the use of lead pipes for conveying cider from barrels to the engine at the public house bar. Cider that had remained all night in the pipes was found to contain appreciable amounts of lead. It was stated that the pipes were tin-lined and that the publicans had been assured by the makers that such pipes could not possibly lead to contamination of cider. In all probability they were what are known as tin-washed pipes.

In making lead pipes, lead at a temperature close to its melting point is forced from a hydraulic press through a die so as to form a continuous pipe which is wound on a drum as it issues from the die. To produce a tin-washed pipe, molten tin is poured from a ladle into the open end of the pipe as it comes out from the press. The tin, since its melting point is lower than that of lead, remains molten inside the hot lead pipe and runs down it, thus coating the inner surface with a very thin film of tin. Apparently this film is not thick enough to protect the lead pipe from the corrosive action of cider, for any considerable length of time, under the ordinary conditions of use. There is another kind of pipe, the true tin-lined pipe, in which there is a lining of block tin at least half a millimetre thick. It corresponds more nearly to a tin pipe with an outer casing of lead.

Unfortunately it is considerably more expensive than the tin-washed pipe, and is therefore not so widely used as it should be. As long as plain lead or tin-washed pipes are used for cider there will always be a danger of the recurrence of outbreaks of lead colic. A previous one was reported to the Ministry of Health in 1924, and the facts in that case were very similar to those of the recent outbreak.

In any case the practice of allowing cider and beer to come into contact with lead is reprehensible. Unavoidable sources of lead in food and drinks are sufficiently numerous without being multiplied unnecessarily. Injury to health from traces of lead does not necessarily begin only with obvious symptoms of lead colic. There may be, and probably are, lesser degrees of lead poisoning, manifested only in generally impaired health and vitality, and not obviously attributable to any definite cause. Pipes properly lined with a thick coating of tin are available, and it would be discreditable alike to wholesalers and retailers if, with the knowledge and experience now available of the action of cider upon lead, they were to be deterred by questions of cost from taking all necessary precautions to prevent the occurrence of lead poisoning.

Use of Enamelled Vessels

Another case of antimony poisoning from the use of enamelled vessels is also reported. The occasion was a Christmas dinner to the staff of a well-known London hospital, when lemonade was served which had been prepared in new enamelled-iron jugs. During the progress of the dinner, and subsequently, one after another of the hospital staff were seized with violent sickness, and eventually 65 out of 70 were more or less seriously affected. It was found that acid lemonade had attacked the enamel and had become highly charged with soluble compounds of antimony.

This is the third case of antimony poisoning that has been brought to the notice of the Ministry during the last four years. The previous outbreaks were at Newcastle-on-Tyne in 1928 and Folkestone in 1929. In the Newcastle case lemonade was prepared in enamelled pails of German origin, and at Folkestone jugs were used which were precisely similar to those implicated in the recent outbreak. No doubt these vessels are not intended for use in preparing or storing food and drinks, and the manufacturers argue that people using pails and water-cans for purposes for which they were not intended, do so at their own risk. The fact remains, however, that people *do* use them occasionally for things like lemonade, for instance, at school treats and similar gatherings, and that there is nothing in the appearance of the vessels to suggest that they are not perfectly safe.

It would appear that it is not necessarily the presence of antimony in the enamel that makes it dangerous, but the fact that the enamel is *not* acid-resisting. It becomes disintegrated in contact with acid and the antimony becomes exposed to the liquid and dissolves.

The Sampling of Food

The returns made by Food and Drug authorities of articles of food sampled for submission to public analysts show that in many cases samples are not always taken to the best advantage. In some instances a number of samples of the same substance may be taken without realising that each sample really represents the same substance supplied by a single manufacturer to a number of retailers in the district, and in this way an unnecessary multiplication of samples may occur. In case, therefore, of articles of food not made by the retailer but supplied to him by a wholesaler or manufacturer, it is desirable, before a sample is sent to the analyst, to ascertain, if possible, from the retailer the source from which it is obtained. In this way sampling in respect of such substances becomes, in effect, a sampling of the wholesaler or producer; much information as to the food supply of the district becomes available, the taking of redundant samples is avoided and plans for sampling can be more intelligently devised and control rendered more effective.

During 1932, 137,981 samples of food and drugs were dealt with by public analysts. This is a considerable increase over the largest number previously recorded. The number of samples reported as adulterated or not up to standard was 7,019, or 5.1 per cent. of the number analysed. This is a slight increase as compared with the two previous years, in which the percentage of adulteration was 4.6 and 4.8 per cent. respectively. Of the total number of samples examined, 72,840 were samples of milk, 5,307 samples (7.3 per cent.) being reported as adulterated or not up to standard. This was a considerable increase on 1930 and 1931 when the corresponding percentages were 6.6 and 6.4 respectively.

Plant and Machinery for the Plastics Industry

A Wide Field for Inventive Design

PLANT and machinery as used in the plastics industry were reviewed by Mr. W. Owen Griffiths, A.M.I.Mech.E., in a lecture which he delivered on September 28, in connection with the Plastics Industry Exhibition which is now drawing to a close at the Science Museum, South Kensington.

The two base requirements of all processes within the plastics industry, said Mr. Griffiths, were heat and pressure, excluding the tool-room where the essentials were precision and inherent skill. Tracing the operations from base resins to finished moulding, he pointed out the chief steps as being (1) the resins were mixed with fillers and pigments; (2) they were bonded on steam heated rollers; (3) the thin bonded sheets were broken into small pieces; (4) the small pieces were disintegrated to powder; (5) the powder was graded for size or made into pellets; (6) it was put in the mould and heat and pressure exerted to form the moulding; and (7) the surplus flash was removed. In only one operation did heat and pressure become interlinked and that was in the boiler. In the industry this important plant unit was used for generating heat for transmission to the various machines, and the questions of abnormally high pressure and superheats did not necessitate attention. Requirements were generally filled by a multi-tubular vertical boiler of the Cochran type working at a maximum gauge pressure of 200 lb. per sq. in.

Dry Mixing Operations

The lecturer then reviewed the processes of powder making. Irrespective of whether phenolic, cresylic, urea resins, or cellulose acetate powders were to be made the first process was the thorough mixing of the ingredients and colours. The machine generally used for this dry-mixing process consisted of two spiral-shaped arms rotating in opposite directions in a drum shaped body into which the mix was placed. Where the mix had a tendency to become more viscous a more rugged type of machine was employed, with a single shaft rotating in the mass. Leaving these machines, which were of the types developed for solution mixing in the rubber industry, and dough mixing in the bakery trade, the mix was now ready for batch mixing.

Three separate types of machine were used for this operation. The first type, the *Bridge Banbury*, was the British edition of the Banbury used in the United States for working rubber to mix. The merits claimed for it were greater uniformity of the finished product, a saving in labour, elimination of the personal element, and saving of floor space. The second type were the "*Universals*," which had progressed some way from their dough mixing designs, for they were required to withstand heavy strains. The rotating arms intermingled the powder constituents and in the same operation drove them against the body of the machine, so assisting in thorough blending. When necessary to draw off moisture or collect solvents, pyramid shaped lids and vacuum type stuffing boxes ensured the maintenance of high vacuum. The third type were *mixing rolls*, in which the weight of the batch depended on the area of surface of roller and thickness of "take off" of the sheet. The rolls were cored to allow for steam heating and water cooling, and were made of cast iron or steel. The largest rollers required can be guaranteed to a tolerance of 1/1,000 in. Makers of repute matched their rollers for hardness, for a hard roller working against a soft one caused discolouration, the bugbear of the industry, which was due to fine iron dust. The general lines of the mills were those evolved for the rubber industry, which had used them continually for mixing and grinding since Thomas Hancock erected a set in his rubber works in Goswell Road, London, in 1821. Bearings had been introduced to combat effectively the effects of abrasion by powder dust. A fourth type, the *ball mill*, was also used, with chain drive replacing the common belt drive.

Phenolic and cellulose mixes left the rollers in the form of thin sheet, and where they were batch milled by any other method they were put through the roll mills as the

final process prior to being reduced to granular powder, the state in which they were supplied to the moulder. The sheet was broken up into $\frac{1}{2}$ to $\frac{1}{4}$ in. squares by passing through toothed rollers, and these pieces were further reduced in a disintegrator. Various forms of disintegrator were used, but their action was more or less the same, the small pieces being allowed to fall into the path of beaters or blades revolving at anything from 1,500 to 3,500 r.p.m. The beaters were numerous and the impact was sufficient to powder the pieces and fling the powder against a screen until small enough to pass through a perforated screen which determined the maximum size. It was then sub-divided into various stages of fineness, either with a flat oscillating sieve or one of the vertical centrifugal type. The powder then went to the moulding shop, either in granular or tablet form for simplicity in loading the mould.

Moulding Equipment

The moulding equipment was the most interesting department. The moulds themselves were the fulcrum of the whole industry. For long runs of an article they were made of the finest obtainable steel, but for short runs could be of tough brass, particularly where ornamentation was involved, since hand engraving could be employed. Single or multi-impressions, dependent on the class and number of articles to be produced, were cut from the solid, or, after hardening and tempering, used as a punch to press into a soft steel block to shape the external forms—the process known as hobbing. The lecturer expressed a preference for a mould in which both halves had been cut from the solid.

Moulds could be fixed or loose. The large moulds rapidly becoming common to industrial concerns made a fixed type the only practical one. Where urea powders were to be used the moulds should be chromium plated or of special stainless alloy. For cellulose acetate moulding the essential feature had to be that of rapid heating and cooling of the moulds. Irrespective of what material was to be worked the moulds now produced in Great Britain were great examples of honest craftsmanship.

Pumping Systems

Turning to the plant side, the lecturer then dealt with pumps. The standard working pressures of these ranged from 2,000 to 2,240 lb. per sq. in. and few troubles were encountered. To-day there were numerous good solid pump designs to work from, and any of them could be trusted to give good and efficient service. The various systems employed were: (1) the constant speed pump feeding accelerators; (2) air-loaded accumulators; (3) variable pressure pumps directly feeding presses; and (4) variable speed pump through fluid coupling.

In the first type the pump fed what was probably the most important adjunct in hydraulic transmission, the accumulator, since this constituted an artificial head in which water pressure was carried by other material than water. In the familiar weight and case types the ram was fitted with a T-head to which weights were hung. These exerted pressure on water within the accumulator cylinder, and as they were raised there was a store of potential energy to be drawn upon through the main pressure line system. With the second type, air-loaded accumulators, which were common on the Continent but as yet not popular in this country, it was possible to vary the main line pressure quickly, always an advantage. This arrangement called for much less floor space. The underlying reason why they were not more commonly used in this country was that the British engineer only used high pressure air when he was forced to do so. The lecturer would not say that he was wise in this, for the installations he had personally inspected had one great defect, that the pressure was not constant, which would cause trouble if a thin-walled article was being moulded.

The main concern of some manufacturers to-day was to mould components for some of their standard production lines, and they installed tools for this purpose in the same way that they extended, for instance, their capstan-lathes.

Their requirements were covered by a self-contained unit which could be set on its work within two hours of its receipt at their works. Two small sets of this type had been working at the Plastics Exhibition since its opening, whilst a third, which, unfortunately, had to remain static due to insufficient strength of floor, was present for inspection. These three had been selected to cover a whole range of types, and the lecturer gave brief descriptions of each to illustrate the third and fourth types mentioned above. One was a Daniels press standing in the entrance hall. It was of the uplifting type, operated by a pumping unit, horizontal, having multiple low-pressure plungers and one high-pressure plunger. The John Shaw machine on the third floor was of a type widely used in Great Britain. It was downstroking, the weight of a ram bringing it to its work, and for opening two jack or side rams were fitted. Its pumping unit was a standard three-throw vertical unit. By an ingenious arrangement a by-pass controlled by spring compression, which could be raised by hand lever, arranged free pumping for the period during which the press was approaching its work, and the spring loading then maintained the constant maximum pressure throughout the curing time. The third type, by Francis Shaw and Co., also on the third floor,

was a plain upstroking press operated by rotary multi-ram pump driven through fluid coupling. It was simple, and free from the engineer's bugbear, springs. Two types were available, one in which the working pressure was predetermined by the graduated amount of oil in the coupling, and the other in which the amount of oil could be varied while the coupling was in motion.

Concluding, the lecturer discussed the types of presses operated from main line hydraulic pressure. They could be (1) upstroking; (2) downstroking, which for units of up to 1,000 tons head had been brought to a high state of efficiency; (3) semi-automatics, which were designed to remove responsibility of the manipulation of the press from the press operative to the engineer; or (4) fully automatic. The lecturer stated that as far as he was aware no large article had been produced in this country by this. He did not include the automatic gramophone record press, for in this the stock is fed into the mould and the finished record removed by hand. As yet no British engineer had built a fully automatic press for the plastics trade, and the types available could be classed as "one press—one mechanic type." The power press was employed for bitumastic based plastics and some small phenolic mouldings.

International Society of Leather Chemists

Annual Conference at Amsterdam

THE bi-annual conference of the International Society of Leather Trades' Chemists was held at the Colonial Institute, Amsterdam, in conjunction with the bi-annual meeting of the I.V.L.I.C. The conference opened officially on September 18, the president, Mr. F. C. Thompson, M.Sc., in the chair. After a formal welcome to all present, the meeting proceeded to elect officers for 1934-5, as follows:—President, Monsieur G. R. Loos; vice-presidents, Mr. F. C. Thompson, Monsieur G. Golchin; general secretary, Dr. J. Gordon Parker; general treasurer, Professor D. McCandlish; members of committee, Dr. C. Schiaparelli, Professor V. Kubelka and Dr. P. Chambard.

The hon. general secretary, in presenting his report, said that the executive committee had not actually met during the past year, but numerous important matters had been settled by correspondence. Special mention was made of the publication in book form by the Society of the papers read at the Protein Conference, and the wide sale which this volume had enjoyed. The hon. general treasurer reported very favourably on the financial position of the society, and specially mentioned Dr. D. Burton for his assistance with mutual membership subscriptions. Reports of sections were presented by M. Fievez (Belgium), Dr. A. Turnbull (Britain), Dr. Kubelka (Czechoslovakia), Dr. Schiaparelli (Italy), Monsieur Vourloud (France), Mr. Paniker (Spain), and Dr. J. Gordon Parker (General).

Mr. F. C. THOMPSON took for the subject for his presidential address, "The Measurement of pH." He emphasised that the pH value of every liquor used from soaks to tan liquors, fat liquors and neutralising liquors had to be determined to effect proper control, discussing in detail the various methods which had been proposed. The present position he summed up as (1) the need for a careful survey of the methods available for the particular case arising; (2) the need for adequate standardisation; and (3) the study of the special problems of (a) sulphited extracts, (b) feebly buffered solutions, and (c) salt error of the glass electrode. At the conclusion of his address, Mr. Thompson formally proposed the formation of a commission for the purpose of studying the question discussed. This was seconded by Mr. R. O. Phillips, and received the approval of the meeting. Mr. Thompson was elected chairman of the proposed commission.

On Tuesday, September 19, the joint conference of the I.S.L.T.C. and I.V.L.I.C. was officially opened by Mr. J. L. Van Gijn, president of the I.V.L.I.C. and also the Dutch section of the latter. A cordial welcome was extended to all, and particularly to Dr. K. H. Gustavson as representa-

tive of the American Leather Chemists' Association. Replying for the I.S.L.T.C., Mr. Thompson thanked the Dutch section for the excellent arrangements which had been made in connection with the Conference. He mentioned that it was a matter of gratification that leather chemists' associations started originally in England, and had now spread throughout the world through the three big parent societies, *i.e.*, the I.S.L.T.C., I.V.L.I.C. and the A.L.C.A. The I.S.L.T.C. agreed to form a separate new Commission on Chrome Liquors, with Dr. P. Chambard as chairman.

In the afternoon, Dr. H. R. KRUYT (professor of physical chemistry, Utrecht University) gave a lecture on "The Colloid Chemistry of Collagen and Gelatin." The problem of the nature of collagen, he said, is rendered the more difficult for colloid chemistry as collagen is an insoluble substance, and the soluble cleavage products had to provide us with the insight we wanted. Recent investigations of de Jong on complex coacervation have made us familiar with insoluble substances resulting from two soluble colloids. The theory of coacervation, especially of complex coacervation, was developed and collagen shown to be a complex coacervate (with arrangement).

On Wednesday, September 20, the conference opened with a joint meeting of the two societies, before which the Leather Analysis Commission report was presented by Dr. Jablonski and Dr. Chambard. A long discussion ensued in which Dr. F. Stather raised objection to two methods for extracting water soluble matter (hot and cold). Eventually Mr. Thompson proposed that both methods be made official, each society deciding which method shall be used. This course of action was agreed upon. Dr. Jablonski reported that no further work had been done on chorme leather analysis, but that during the next two years Mr. Innes will be studying the matter more fully. A short report on the physical properties of leather was also given by Dr. Jablonski, after which there was a joint meeting with the International Tanners Council, with Mr. Van Gijn in the chair. He welcomed the tanners and said that he sincerely hoped that by close working, tanners and chemists would be able to do something in connection with the increasing use of leather substitutes.

Professor M. BERGMANN followed with a lecture on hides and skins, and after a discussion it was agreed to form a committee to consider the question of hide and skin improvement, especially in connection with warble damage. This committee consists of W. Freudenberg and Dr. E. Snow (representing tanners) and Professor M. Bergmann and Dr. A. Gansser (representing chemists).

Letters to the Editor

The Editor welcomes expressions of opinion and fact from responsible persons for publication in these columns. Signed letters are, of course, preferred, but where a desire for anonymity is indicated this will invariably be respected. From time to time letters containing useful ideas and suggestions have been received, signed with a nom-de-plume and giving no information as to their origin. Correspondence cannot be published in THE CHEMICAL AGE unless its authorship is revealed to the Editor.

Lead-Lined Plant and Chemical Stoneware

SIR,—Certain of the statements made in the article on "Lead-lined Plant and Chemical Stoneware" in THE CHEMICAL AGE of September 16 (p. 249) might have been allowed to pass without comment as irresponsible but for the fact that its sponsors are so important a body as the British Chemical Plant Manufacturers' Association, and also that great satisfaction is expressed with the results obtained, so much so that it is proposed to initiate similar investigations in the future.

In pointing out that the heating up of stoneware must be done with great care since brittleness is a characteristic inherent in all stoneware, it is stated that British-made stoneware is superior in *many* respects. Since only one specific property, that of resistance to heat, is in question, the claims made on behalf of British ware are vague and unconvincing.

The definite statement that the glaze on chemical stoneware was *frequently* more porous than the stoneware itself is perfectly absurd. All glazes, it is true, have a certain porosity, but very delicate apparatus is necessary to detect it, and for all practical purposes any normal glaze may be considered as absolutely non-porous.

The remark that the glazes used on *many* foreign stonewares contained objectionable amounts of iron, and the obvious inference that British manufactured ware was, in comparison,

relatively free from the metal, is incorrect. Three distinct types of glaze are used for chemical stoneware: (1) the salt glaze, (2) a felspathic glaze of the porcelain type, and (3) the so-called slip glaze, which is a natural fusible clay. All types contain iron, the salt glaze from about 2 per cent. to 8 per cent., the felspathic under 1 per cent. and the slip glaze about 8 per cent. Curiously enough the chemical resistance of the slip glaze is very high in spite of the iron. Practical experience has demonstrated that the presence of iron in glazes used on stoneware is not objectionable and can be ignored providing the composition, in other respects, is satisfactory.

It is incorrect to say that stoneware should in no case have a porosity greater than 1 per cent. and that a *much* lower figure could be obtained. It is customary for chemical stoneware manufacturers to supply various grades of material, having very different porosities, *i.e.*, for certain purposes a porosity of 12 per cent. is desirable. Any manufacturer who could consistently supply large chemical stoneware plant with 1 per cent. porosity would have every reason to be satisfied, but I very much doubt if this is possible of attainment. I hold no brief for foreign stoneware—in fact quite the contrary.—Yours faithfully,

MAURICE BARRETT, M.I.Chem. E.

Leeds.

Sugar Manufacture in the Irish Free State

Government Plan for Four Factories

SINCE the Irish Free State Government announced its intention of proceeding with the development of the sugar-manufacturing business nearly fifty districts have been clamouring for a factory; and it was certain from the beginning that about forty-seven of these were doomed to disappointment. The ideal which the Government has set before the country is that all the sugar needed in the Free State should be manufactured within its borders from beet grown in the country itself. It is also part of the Government's plan that the manufacture should be spread as nearly equally as possible throughout the entire country, and as the province of Leinster has had a factory in Carlow for nearly ten years, the selection of the sites for the new factories lay within the provinces of Munster, Connaught and the Free State counties of Ulster. As the sites have been tentatively selected, subject to the guarantees of the necessary supplies of beet being forthcoming, two of the factories are to be allotted to Munster (at Mallow, Co. Cork, and Thurles, Co. Tipperary) and one to Connaught (at Taum, Co. Galway).

A new Free State Sugar Company has been formed, with the Czecho-Slovakian manager of the Carlow factory as its managing director, to acquire the Carlow factory from its Belgo-Czechoslovakian owners, and to run it in future as an integral part of the group of four factories.

At present the Irish Free State imports sugar to the annual value of about £800,000, and even the four factories will not quite fill the demand. It is estimated that the four factories will produce between 100,000 and 120,000 tons of sugar a year, and that a minimum of 52,000 acres will need to be cultivated for the production of the beet. In each of the areas which have been designated as sites for the new factories, guarantees will have to be secured for a minimum of 13,000 acres before the factories are started, and committees have been set to work to secure these guarantees from the farmers. That the guarantees will be secured is certain; but it is also certain

that trouble will arise at a later date, as it did in Carlow two years ago, about the price to be paid for the beet.

The Carlow factory is to be taken over at an agreed price, probably the figure of its paid-up capital of £400,000, and as only an infinitesimal proportion of that capital is held by Free State people, that sum will leave the country almost at once. Last year the Carlow factory reported a net profit of £85,000 after receiving a subsidy of £162,000—a clear indication of the uneconomic state of the whole business. The view of the Beet Growers' Association is that the industry should be developed on co-operative lines, under the joint control of the State and the growers, and that the price to be paid for beet should be fixed in accordance with the production costs. At a recent meeting of the association its chairman pointed out that "the suggested price, 35s., is really 30s. a ton on the present basis, and represents a reduction of 9s. a ton on the present price at the Carlow factory, and the association has warned the Government that it has selected a dangerously low minimum."

There is no intention in the Free State of developing an export trade in sugar, as a small amount will still have to be imported even when all four factories are in full work; but it may well come to pass that the experience of Czechoslovakia will be duplicated in the Free State. Sugar costs 5d. a lb. in Prague, but the same sugar is sold in England at £7 a ton! What the Free State consumer will have to pay is unknown, but either as taxpayer or consumer it is plain that the price cannot be less than £21 a ton, or 2½d. a lb., as a minimum. The cost to the State cannot yet be estimated, but a warning was sounded by Senator Guinness when he pointed out that the British Government had paid about £24,000,000 in subsidies, or approximately 25s. a day per worker employed in sugar-making.

Over £2,000,000 has already been spent by the Free State in subsidising the Belgo-Czechoslovakian sugar factory in Carlow.

The Institute of Chemistry in the Provinces

Conference of Local Section Secretaries

THE latest issue of the Journal of the Institute of Chemistry contains a report of a conference of hon. secretaries of local sections held during the summer in London to discuss publicity; co-operation with the secretaries of other societies in arranging programmes; provision of lecturers; arrangements with headquarters for printing and issuing circulars, notices, etc.; development of uniformity in the conduct of the business of local sections, and in reporting their proceedings; promotion of sociability among chemists; cinema films; joint meetings of sections; and the appointments register.

The Conference decided to suggest to the Council that it should investigate the question of creating a liaison with the Press, with a view to securing more suitable and adequate publicity in order to make known in an accurate manner important advances in the science and practice of chemistry. Publicity might be given to new discoveries of interest and importance, by means of articles prepared by chemists with special knowledge.

Co-operation between Sections

On the question of promoting co-operation between local secretaries and arranging programmes, the conference learned that in the majority of important centres where there were large numbers of chemists, joint meetings with the local sections of other bodies were very usual. In some of the large centres, for example, in Glasgow, Liverpool and Manchester, comprehensive programmes were prepared, giving particulars of all the meetings of learned societies within the district. In a few cases, well-known lecturers had dealt with the same subject before several sections, and often jointly with local sections of other societies.

Regarding the question of the development of uniformity in the conduct of the business of local sections, it appeared to be generally accepted that, although the general rules for sections were laid down in the by-laws of the Institute, it was unavoidable that the subsidiary rules should vary with the extent of the membership and local conditions in different centres. It appeared to be impossible to formulate model rules suitable for all Sections.

Reports of Meetings

With regard to the reporting of the proceedings of local sections, there was a consensus of opinion that lectures consisting mainly of textbook matter should either not be contributed to the Journal of the Institute, or confined only to very brief reports; and that lectures of a scientific or technical character given before joint meetings of two or more societies, should be sent to the technical Press, although *précis*, not exceeding a page or two, should be contributed to the Journal where the matter dealt with was of sufficient importance and interest to warrant the space. The official publication of the Institute being "domestic" rather than technical in character should, however, contain a complete record of the proceedings of each section, while attention should be directed to lectures which were felt to be sufficiently important to be printed as monographs for the benefit of the members generally. In some cases, lectures were filed, and the manuscripts could be borrowed by those who were specially interested.

This discussion led to further consideration of the question of reporting meetings and lectures. Some sections arranged for the hon. secretaries or other members to be responsible for reports. Others secured the assistance of experienced stenographers. It appeared to be difficult to obtain reliable accounts of discussions, but this could sometimes be done by asking speakers to supply their remarks in writing. The hon. secretaries had to do the best they could to secure records for the Journal.

Sociability Among Members

In considering means to be adopted for promoting further sociability among chemists, reference was made to summer outings, visits to works and other places of interest, dinners, dances and concerts. In most cases, the local sections were

able to arrange occasionally for such functions, in order to bring chemists together in friendly intercourse, although it was not desirable that the expense involved should become a burden to the younger members. There had been a great improvement in the attendance at meetings of chemists since the formation of the local sections of the Institute. The hope was expressed that the president and other hon. officers of the Institute would visit the local sections more frequently in order to encourage good attendances.

The chairman raised the question of exhibiting films, and reference was made to films dealing with motor car manufacture, plastics, acetylene, seed-crushing and oil extraction, tar, bridge construction, steel manufacture, road making, sulphur, dyestuffs, etc., nickel refining, and various industries. The opinion was expressed that many so-called "technical" films included irrelevant matter of no special interest to professional chemists. The conference considered it desirable that as much information as possible should be available with regard to the hiring of films dealing with scientific and technical subjects.

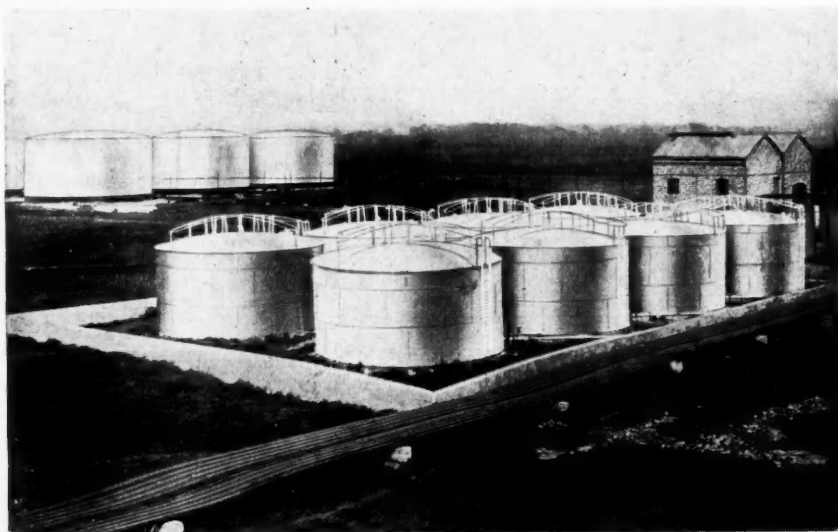
Joint Meetings

Reference was made to joint meetings between local sections of the Institute and to meetings away from the more important centres. It was learned that the Birmingham Section occasionally met at Derby, and the South Wales Section, at Cardiff; that the three Scottish Sections held a joint annual meeting, and that the London Section had met at Portsmouth. The conference agreed that it was desirable that section meetings should be held occasionally away from the headquarters of the sections respectively.

The report of the conference was subsequently submitted to the council when the recommendations dealing with publicity and the arrangements for lectures, were referred to the publications committee; those regarding the hiring of films dealing with scientific and technical subjects, were referred to the registrar; that suggesting that the president and other officers should visit the local sections more frequently, was referred to the hon. officers; and the one recommending local sections to hold meetings occasionally away from their own respective headquarters, was referred to the local sections themselves. The question of holding a meeting of hon. secretaries of local sections is to be raised each year in October.

German Colour Industry Cartel Urgently Needed

THE situation of the German colour and mineral pigment industry has become steadily worse, and it now constitutes one of the most distressed of Germany's economic branches. There has been a sharp shrinkage in sales due to the stagnation in building activity and consequent severe curtailment in manufacture of paint, the main consumption outlet; depression in other important consuming branches, linoleum, oil-cloth, wallpaper, plastics, rubber goods, etc., also contributed to narrowing sales. The pigment industry feels that the only effective remedy for the virtual chaos now reigning lies in the creation of a compulsory cartel. Producers have appealed to the Government for the institution of a compulsory cartel embracing all producers, from the smallest to the largest, in accordance with the recently enacted cartel law providing for governmental intervention in trade and industry and the establishment (as well as dissolution or modification) of cartels were found desirable by the Ministry of Economy. It is proposed that the cartel be of a special character known as a "calculation" cartel, adapted to the peculiar needs of the pigment industry, and that its scope be confined to the regulation of prices for both raw material and finished goods, producers retaining entire independence in direct sales relations with consumers, without limits upon their output, to the end of preserving the elements of private initiative indispensable for the industry's progress.



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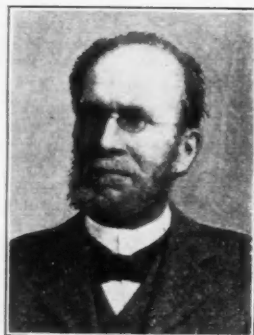
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Death of Mr. J. B. Orr

The Founder of the Lithopone Industry

MR. JOHN BRYSON ORR, J.P., whose death occurred in London on September 23, was one of the most widely known personalities in the chemical industry of Merseyside. He had lived in the district for nearly 40 years, first at Ditton, and later at Cross Acres, Woolton, and had been a magistrate on the Widnes bench since 1907.



The Late Mr. J. B. Orr.

Mr. Orr was born in 1840 at Blantyre, Lanarkshire, and started his career with a Glasgow firm of oil and colourmen and drysalters. His studies in chemistry at the Andersonian University led him, in 1861, to commence experiments with mixed zinc and barium pigment of the nature of lithopone, and he succeeded in producing some in bulk as early as 1868. After an absence of four years in

Europe, where he worked with a colour concern and also acted unofficially as war correspondent for a Glasgow News-

paper, he returned to Glasgow and started a small concern for the manufacture of lithopone, taking out patents in 1874. In 1880 the Silicate Paint Co. was formed by Mr. Orr and his partner. It was in their factory at Charlton, London, S.E., that the first washable distemper, "Duresco," was produced. "Charlton White" was another manufacture, and the firm still produces paints and varnishes at Charlton.

It was not until 1896 that he embarked on what was to be his greatest business venture. Orr's Zinc White, Ltd., started the manufacture of lithopone in that year at Widnes. This firm and its subsidiaries now produces about 300,000 tons of lithopone in America and 200,000 in Europe. The concern was acquired by the Imperial Smelting Co. in 1930, Mr. Orr remaining a director until the time of his death.

He was one of the original members of the Society of Chemical Industry, which was founded in 1881. His newspaper work during the Franco-Prussian war was not his only service to journalism. He was a man of wide education, and from time to time contributed articles to various journals.

The funeral took place on September 26 at Allerton Cemetery, and was attended by over 300 members of the Widnes firm. Mr. Orr was a member of the Church of Scotland.

Prince George Opens New Monsanto Power Plant

A Modern £70,000 Installation

PRINCE GEORGE, accompanied by his equerry, Major Butler, and Lord Howard de Walden, Lord Lieutenant of Denbighshire, honoured the Monsanto Chemical Works, Ltd., Ruabon, North Wales, with his presence on September 26. The distinguished party was received by Mr. Aled O. Roberts, M.P. for Wrexham, and directors and officials of the Monsanto organisation, and was conducted round the offices, works and laboratories, the new modern warehouse and the recreation club and grounds. The new power plant was formally opened by Prince George, who expressed great interest in the installation and equipment.

The British chemical industry, which has in the past few years made great efforts to supply its own markets against foreign competition, will find interest in reading of this development which is designed to lower manufacturing costs, and with a view to further expansion. The new steam and power plant, which cost £70,000, is the work of British labour, and meant orders for a number of British engineering companies. The boiler installation was supplied by the Surling Boiler Co., Ltd., the coal burning equipment by the Underfeed Stoker Co.; coal handling equipment by Edward Bennis and Co., Ltd.; boiler feed pumps by Mather and Platt, Ltd.; water conditioning equipment by the Paterson Engineering Co.; turbines and electrical equipment by Metropolitan-Vickers; cables by the General Electric Co., Ltd.; and control equipment by Allen West and Co., Ltd. The building was designed by C. S. Allott and Son, Manchester; and the building was carried out by J. Gerrard and Son, Ltd., Swinton, Manchester.

Generating steam at 450 lb. pressure, and 720° F., considerable electric power is generated by passing the steam through modern turbines, which exhaust the steam at 150 lb. pressure and 425° F., this then being used for plant processes. The steam thus does double duty, generating power for plant use prior to being used for heating purposes. This new installation by no means exhausts the policy of expansion and development of the Monsanto organisation, whose advancement to its present important position in the chemical world is one of the romances of the industry.

From small beginnings in 1867—sixty-six years ago—when

the Ruabon Works became entirely concerned with the production of carbolic acid (phenol)—with a weekly output of a few hundredweight—there has developed a tonnage of pure natural phenol larger than the combined output of all other makers of this product. It is interesting to record that the works first raised the melting point of phenol from the accepted early standards ranging from 35/39° C. to 39/40° C., and for many years now the works standard has been 40/41° C., the highest possible purity point. The manufacture of cresylic acids and cresols was a logical outcome of the company's activities with phenol, and always with a strict standard of quality to maintain those products soon became accepted by discriminating consumers.

In 1915 further developments resulted in the production of fine and medicinal chemicals, which, in spite of the fierce competition of German suppliers, gradually merited the demand of British consumers. Another important installation was concerned with the manufacture of saccharin, and it was not long before the Monsanto brand was known throughout the world, and was extensively used in the mineral water trade of this country.

The most rapid strides have been made within the last few years, with the purchase of plant and goodwill in various parts of England, engaged in the manufacture of saccharin—methyl salicylate—and tar products. The manufacture of chemicals for the rubber trade at Ruabon was another important step, and most of the chief products hitherto made by the Rubber Service Laboratories, Akron, Ohio, are now British made Monsanto products. By reason of this spirit of progressive policy, Monsanto chemicals to-day cover a range of over 230 products, which are shipped to every corner of the industrial world.

The chief chemicals are phenol, cresols, cresylic acids, lysol, disinfectants, salicylic acid, aspirin, sodium salicylate, methyl salicylate, saccharin, phenacetin and rubber accelerators. The registered offices are at Victoria Station House, Victoria Street, London, S.W.1, where modern business efficiency methods are employed to deal with the mass of details resulting from the company's ramifications throughout the world.



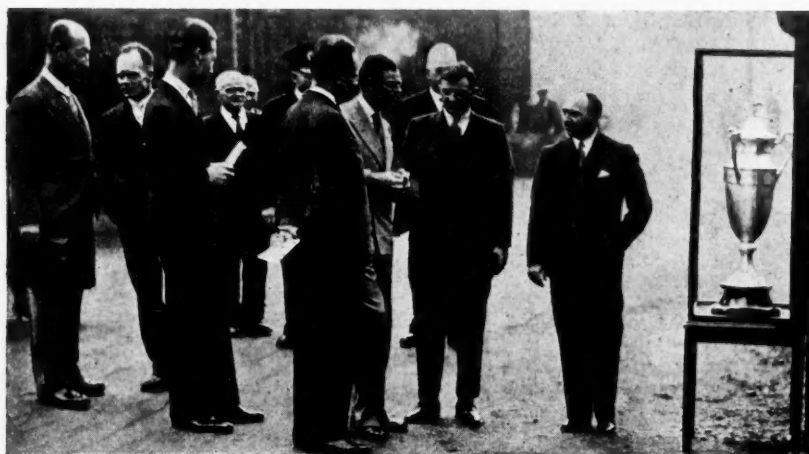
H.R.H. Prince George with Dr. W. H. Garrett, Manager of the Ruabon Works.



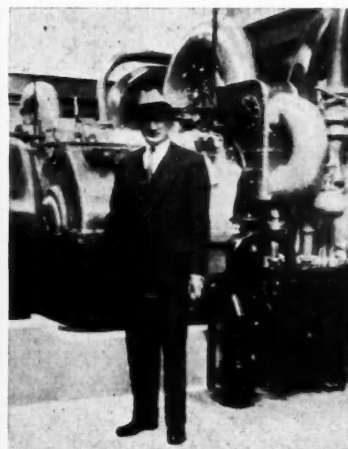
The Prince with Mr. T. P. Berington, Vice-Chairman of Monsanto Chemical Works, Ltd., and Dr. W. H. Garrett at the entrance to the Monsanto Recreation Club.



His Royal Highness inspecting the Works. With him are (left to right) Major H. W. Butler, M.C., (the Prince's Equerry), Mr. T. P. Berington, Mr. G. Guest (Chief Constable of Denbighshire) and Dr. Garrett.



Prince George reading the Safety Score Board. Lord Howard de Walden is on the left talking to Dr. Foott. Mr. Aled O. Roberts is on the extreme right. In the centre facing the camera is Mr. Wright, chairman of the Cefn Parish Council.



Mr. C. J. Colley, engineer-in-charge, who was responsible for the design and erection of the new plant.

British Standard Colours

Work of the British Colour Council

THE dyeing of the silk ribbon showing colours to appear on the British Colour Council's standard card will shortly be completed, after which the card will be issued as soon as the material is mounted. The production of this card will mark the greatest achievement of modern times in assisting British and Empire industries with colour definition. Patterns of pure silk ribbon with a name allotted to each will make known as standards those colours which are used in all industries and for which there is a permanent demand.

It should be understood that these standard colours are issued by the British Colour Council in addition to the seasonal fashion colours and will remain standard for all time. It has been necessary to collate all the various samples of colours bearing the same name; investigating as to which sample is the truest representation of the colour under consideration, and then further, going into the question as to whether such a colour has been known previously by another name or names. With certain colours it has also been necessary to study the foreign translation as these may now have become known in this country as an entirely different hue. For example, one could quote "mole" and the French word "taupe," mole being usually represented by a deep grey on the cold side, while taupe is generally recognised as a much browner colour. This state of affairs leads to confusion and has arisen in the first case owing to some person not knowing that "taupe" was merely the French name for "mole." Apart from this line of research, colours used in the textile trade have also been taken into consideration, and this does not only apply to colours usually used in

connection with the women's trade, but also those in the men's and furnishing fabrics trades.

The colours used for carpets, hardware and kitchen utensils, ready-mixed paints and artists' colours have been fully investigated and are just as important to this scheme of definitely attaching a name to one colour and one colour only. Thus, it should now be possible for a woman, not only to be able to have a complete ensemble in "bottle green" and know that at each shop she enters and asks for the British Colour Council's "bottle green" or "standard bottle green" will she obtain the one and only shade known under that classification, but she will also be able to have her kitchen in one hue of green, red or grey as the case may be, with the kitchen stove, linoleum, curtains, pottery, tea and coffee canister, etc., also all in the same definite colour under a given name.

The British Colour Council is also preparing a dictionary to be issued with the colour card. This dictionary will not only give information respecting the colours on the card, but the names by which these colours have been known, including foreign names. It must not be thought that this standardisation of certain colours will in any way affect the "exclusive" colour produced by any firm or the seasonal fashion colours promoted by the British Colour Council; it will be in the nature of a dictionary, doing for colour what the Oxford Dictionary has done for words. It will also be the code book of colour for shippers. Approximately 200 colours will be shown on the card, but the dictionary will contain many more names.

Argentine Tariff Concessions

Substantial Reductions of Custom Duties for Chemicals

ARGENTINA'S tariff concessions to the United Kingdom, under the supplementary agreement signed at Buenos Aires on September 26, were briefly referred to in the last issue of THE CHEMICAL AGE (page 312). The concessions include reduced tariffs on cotton and wool textiles, artificial silk goods and linen goods. There are smaller concessions in regard to metals, machinery and vehicles and reductions in the tariffs on chemicals, paints and varnishes, pottery and glass, foods and beverages and other goods.

In 1931 the value of United Kingdom exports to the Argentine was £19,500,000, according to the Argentine official returns. It is estimated that of this total, trade to the value of about £5,900,000 is covered by Customs duty reductions or modifications, including trade to the value of £72,000 in motor vehicles, for which a new tariff classification, with Customs duties partly on a weight basis, has been agreed upon. Trade to the estimated value of £5,600,000 is covered by conventionalisations of exemptions from duty, and trade to the estimated value of £2,600,000 by conventionalisations of Customs duties.

The supplementary agreement is concerned mainly with tariff concessions by Argentina. Reductions of Argentine Customs duties are accorded on many goods of interest to United Kingdom trade with the Republic, and conventionalisations of duties (or exemption from duty) are granted in regard to other classes of goods. Reductions and conventionalisations relate to Customs duties proper. In addition to Customs duty, imported goods of kinds liable to Customs duty are subject to a surcharge of 10 per cent. *ad valorem* (calculated on the official tariff valuations), imposed as a temporary measure in October, 1931. This surtax is to be gradually reduced, starting in November of this year and being finally extinguished by the end of 1934. The new agreement precludes the Argentine Government from raising the surcharge above 10 per cent. during the currency of the agreement.

Substantial reductions of the Customs duties have been conceded in respect of various soda compounds, white and red lead, copper sulphate, ultramarine blue, fruit salts, salt, metal polishes, gunpowder and dynamite; also in respect of such products for the medicinal treatment of livestock as are dutiable. Duty-free admission of sheep-dip (an important trade) has been conventionalised. The tariff classification of paints and varnishes has been revised and technically improved, and reductions of duties, of varying amounts, have been conceded in respect of most classes of these goods.

In 1931 the official tariff valuations were increased by 25 per cent. for most goods in the "pottery" and "glassware" sections. Under the new agreement, this increase has been cancelled (resulting in a reduction of the present Customs duties by 20 per cent.) in respect of household and table earthenware, certain sanitary earthenware, and certain sheet glass.

Reductions of present duties have also been obtained for china clays and candles. Argentina has agreed to conventionalise the freedom from duty now accorded to coal and coke; and also to conventionalise the present Customs duties on cement and a few other items.

On the basis of the recorded value of imports into Argentina in 1931, the estimated value of United Kingdom trade with Argentina in that year covered by reductions of duties and by conventionalisations of present duties or exemption from duty, so far as concerns chemicals, etc., is as follows:—

	Reductions	Conventionalisations
	£	£
Chemicals, paints, and varnishes	492,000	742,000
Pottery and glass	245,000	38,000
Foods and beverages	96,000	27,000
Other goods	22,000	5,057,000

Of the £5,057,000 conventionalisations in respect of "other goods" £4,822,000 is accounted for by coal and coke (free of Customs duty).

Chemical Notes from Overseas

Spanish Potash Exports

SPANISH potash exports rose in 1932 to 65,989 metric tons, from 25,649 in 1931 and 22,536 tons in 1930. The 1932 exports were chiefly destined as follows: Sweden, 23,270 tons; United States, 10,635; United Kingdom, 8,855; and Italy, 2,331. The Netherlands, an important market for Spanish potash in early 1933, is not separately shown in the preliminary 1932 official statistics. Concurrent with the rise in exports, imports of potash into Spain declined from 19,172 tons in 1929 to 7,652 tons in 1932.

Chilean Sulphur Production Increases

SULPHUR production in the Antofagasta district increased slightly during the last few months (to 1,150 tons monthly, as compared with 1,000 last year.) It is anticipated that the production will increase at least 75 per cent. in the next three months. Most mines are on a nine-month producing schedule on account of the snow and ice interfering with their activities from June to September. Of the four producing properties in the Antofagasta region, that of Volcano Ollague accounts for the bulk of the output.

Cyanides from Ruhr Coke Oven Industry

FROM an account of last year's activities of the research organisation the Gesellschaft für Kohlentechnik ("Chemiker-Zeitung," July 29, 1933, page 598), we understand that cyanides are now being successfully manufactured on the semi-works scale. It is hoped to enter the field of synthetic organic products utilising cyanide as the starting point. Another interesting development is a new process of sodium carbonate manufacture which is giving satisfactory results both technically and economically, and is also being operated under license in another country.

Germany's Export Trade in Soda Ash

GERMAN exports of soda ash expanded notably in 1932, when shipments reached 94,654 tons. Germany and Great Britain were the only important exporters of soda ash to increase their foreign shipments to any notable extent in 1932. It has been estimated that world exports of soda ash amounted to 600,000 tons in 1930, that the trade decreased to 420,000 tons in 1931, and rose to 480,000 tons in 1932. Whereas Germany supplied 12½ per cent. of the exports in the peak year 1930 and 14.6 per cent. in 1931, its share of the international trade rose to almost 20 per cent. in 1932. German distribution is limited largely to Norway, Sweden and Denmark, and the good showing made in 1932 was due to increased demands from Norway, where soda ash is employed in the manufacture of synthetic sodium nitrate. Exports of soda ash from Germany for the first half of 1933 totalled 43,840 tons, as compared with 44,269 for the corresponding months of 1932.

Negotiations between Potash Cartel and Spanish Producers

ALLEGED long-term contracts for the delivery of a substantial tonnage of Spanish potash to the Netherlands market have upset the price structure, until recently regulated by the cartel of producers in Germany, France and Poland. The contracts, which are said to run for several years, are between the Sociedad Potasas Ibericas, in which the powerful French chemical firm, Alais, Froges et Camargue is interested, and "Viska," the Netherlands distributor. Ibericas is a new factor in the trade, its first shipments having been made in 1932. Failure of negotiations between the European cartel and the Spanish producers to reach a marketing agreement for Netherlands led to another price reduction of 15 per cent., following a previous reduction of 15 per cent. and increased discounts of 5 to 8 per cent. granted early in July. Netherlands import statistics for the first half of 1933 show total receipts of 47,768 tons of potash, but the records fail to disclose the quantity received from Spain. German export statistics show a decline in total exports of potash during the first six months of 1933 to 159,166 tons from 200,183 tons in early 1932. Half of the total loss was accounted for by the decrease in shipments to the Netherlands, which fell to 11,071 tons from 32,775 tons.

France Experiments with Colloidal Rosin

THE use of colloidal resin in anticryptogamic mixtures will, it is asserted, if successful, provide the naval stores industry with a new outlet for its rosin, especially the darker grades, and will be of interest to viticulturists, because of the superiority of such mixtures over ordinary Bordeaux mixtures. If prolonged usage of colloidal rosin in anticryptogamic mixtures gives as good results as those claimed experimentally, viticulture will benefit from an economy in labour and raw material (copper sulphate). The two main advantages claimed for such mixtures are that they adhere better to the grape leaves and that they are not easily washed away by rain. Consequently, the grape wines need fewer applications of sulphate mixture.

Forest Pests in Germany

THE appearance of a dangerous forest pest on a large scale in the fir forests in Ostmark and Grenzmark, to the west of Poland, has caused the German Government to undertake an active campaign for exterminating the pest. About 25,000 acres of fine forest have been discovered to be exposed to the scourge and a fleet of 10 aeroplanes will be used for spraying insecticide in an effort to save the forests. The large scope of the campaign is indicated by the fact that 500 tons of contact insecticides will be used for exterminating the moths, which will be sprayed from the aeroplanes making flights in the early morning and late evening. The two products chiefly used are "Verindal" made by the Schering-Kahlbaum A. G., of Berlin, and "Forestit" made by E. Merck and Co., of Darmstadt, both leading pharmaceutical concerns. Other firms supplying part of the order are Gebrüder Borchers of Goslar; Guttler and Co., G.n.b.H., of Hamburg; and Ruberoidwerke A. G., of Hamburg.

The Work of the Inventor

Ninth International Exhibition of Inventions

THE ninth International Exhibition of Inventions, organised by the Institute of Patentees (Inc.), opened at the Central Hall, Westminster, on October 4, and will continue until October 14. This exhibition has a three-fold purpose. In the first place it brings before manufacturers, particulars of inventions which are awaiting commercial development; secondly, it enables inventors and patentees to meet individuals with whom they can discuss the technical details and commercial development of their inventions; thirdly it stimulates public interest in invention. The exhibition is now recognised as a centre where manufacturers can, without being bothered with endless correspondence, models drawings, etc., see new inventions and make an immediate inquiry from the Institute of Patentees (Inc.), should they be interested.

Among the exhibits in the "New Inventions" Section there is a safety valve designed to prevent the risk of fire in overturned motor vehicles, to prevent fuel evaporation, and to prevent the spilling of fuel from a motor vehicle at any time, particularly when the tank is being filled. Fuel can be admitted at will merely by inserting the fuel supply nozzle into the tank. Immediately the nozzle is withdrawn the valve is closed, air automatically enters; neither can repass the valve. This valve (Exhibit No. 234) might also find good use when fitted to drums containing inflammable liquids.

A new gas washer (Exhibit No. 242), in which no filling-mass is used, was also exhibited. It is pointed out that in ordinary scrubbers and washers the filling gets spoiled by deposits of tar, lime, etc., back pressure then increases and the washing effects diminishes. The tar separating capacity of this washer is said to be very good. At one of the largest municipal gas works in Holland a rotary ammonia washer of 2.5 million cu. ft. per day was modified on this principle and now washes 6.5 million cu. ft. per day.

News from the Allied Industries

Iron and Steel

SHEFFIELD is producing a much greater tonnage of steel than in pre-war days, and about 27,000 tons a month more than at this time last year, said Mr. C. J. Walsh, general manager of the United Steel Companies, Ltd., when installed as Master Cutler of Sheffield on October 3.

Insulation Material

TURNER AND NEWALL, LTD., have decided to consolidate the manufacture and sale of asbestos cement and asbestos electrical insulation goods into one organisation. As from the beginning of next month the whole of the company's interests in this particular branch of industry will be taken over by a new undertaking to be known as Turner's Asbestos Cement Co., which will have its headquarters at Trafford Park, Manchester. As a result of this decision, four subsidiary businesses will be wound up, the companies concerned being Turner's Asbestos Cement, Ltd., Asbestos Cement Building Products, Ltd., Bell's Polite and Everlite Co., and British Fibrocement Works, Ltd. To a large extent this reorganisation has been already effected.

Non-Ferrous Metals

DIRECTORS OF THE CORNISH TIN MINES met at the offices of Bewick, Moreing and Co., 62 London Wall, on September 28, when it was agreed, with one dissentient, that the principle of restriction should be extended to Cornwall. A sub-committee appointed to implement the proposal includes Mr. F. Allen (chairman), Mr. Arthur Thomas, Captain A. H. Moreing, Mr. W. T. Anderson, Mr. Harold Edwards, Mr. F. S. Hooker, and Mr. Richard Hirsch. Mr. Francis Allen is chairman of South Crofty, Ltd.; he is also chairman of the Anglo-Nigerian Corporation. Captain Moreing is chairman of East Pool and Agar, and of Cornish Kaolin. Mr. W. T. Anderson is chairman of the Geevor Tin Mines; he is also a director of the Anglo-Burmah Tin Co. Mr. F. S. Hooker is chairman of Wheal Reeth Tin and a director of the Penzance Syndicate; he is also on the board of the Kay Tin Mines (Kintal).

Rubber

THE COUNCIL OF THE RUBBER GROWERS' ASSOCIATION has set up a Rubber Regulation Committee. Messrs. W. J. Gallagher and J. Fairbairn, chairman and vice-chairman respectively of the association, will serve on this committee, other members being F. D. Ascoli, N. C. S. Bosanquet, C. Figg, J. G. Hay, E. D. Hewan, G. H. Masefield, E. MacFadyen, H. E. Miller, J. L. Milne, E. B. Skinner, Sir Frank Swettenham and Sir Herbert Wright. The foregoing list includes the names of almost all the recognised leaders of the industry, from which it may be inferred that the committee will be engaged on important business.

A RECONSTRUCTION SCHEME providing for the reduction of capital and the transfer of the control of the company to the Dunlop Rubber Co., is being submitted to shareholders by the directors of the Indian Tyre and Rubber Co. (Great Britain). Under the scheme the 625,000 $7\frac{1}{2}$ per cent. cumulative participating preference £1 shares will be written down to 12s. each, and subdivided into 1s. shares. One out of every 15 of these sub-divided shares, or 500,000 shares will then be converted into fully-paid ordinary 1s. shares and the remaining 1s. preference shares will be consolidated into 350,000 7 per cent. cumulative preference £1 shares. Preference shareholders are also to forgo arrears of dividend to December 31, 1933 and to relinquish their participation rights. It is stated that the company owes £250,000 to the Prudential Assurance Co. As this loan is repayable on demand the directors have arranged for the provision of £275,625 additional capital so that it can be repaid. The new money will be furnished to the extent of £235,000 by the Dunlop Rubber Co., which has agreed to subscribe at 2s. per share for 2,350,000 ordinary 1s. shares subject to the capital reduction scheme being sanctioned by the Court.

Paper

BOWATER'S PAPER MILLS, LTD., is understood to have signed an agreement to acquire the assets and undertaking of Price Bros., the Canadian paper makers, for a sum of about 5,000,000 dollars. A new company will probably be formed, and its shares will be the subject of the present deal. About one-fifth of the shares may be offered to the existing stockholders of Price Bros., and the rest will presumably be retained by the Bowater group.

Plastics

THE BRITISH CYANIDES CO. has acquired the Pollopas patents controlling the manufacture of resins and moulding powders of the urea type for Great Britain, certain Continental countries, and the British Empire, with the exception of Canada. The company has also entered into an arrangement for full exchange of patents and information with the licensees of the Pollopas patents in Europe, *i.e.*, the I.G. group in Germany, and Etablissements Kuhlmann in France. Mr. J. C. Vredenburg, managing director of Pollopas, Ltd., has joined the board of the British Cyanides Co.

Wholesale Druggists

AT AN EXTRAORDINARY GENERAL MEETING of Sangers, Ltd., held on October 4, resolutions increasing the capital of the company to £1,040,000 by the creation of 360,000 $5\frac{1}{2}$ per cent. cumulative preference shares at £1 each and 720,000 ordinary shares of 5s. each, were passed unanimously. At a subsequent separate meeting of the holders of the cumulative preference shares a resolution altering the rights attached to the preference shares was adopted. It is anticipated that about 200,000 of the new preference shares and a similar number of ordinary shares, to finance the acquisition of the business of May, Roberts and Co. will be offered early next week, the preference shares at par and the ordinary shares at a premium.

Artificial Silk

A CIRCULAR HAS BEEN ISSUED to shareholders of the Alliance Artificial Silk Co. by the Shareholders' Protection Association suggesting concerted action to safeguard the interests of the proprietors. The association takes the view that at the first available opportunity a committee of shareholders should be appointed to consult with the board and investigate the affairs of the company, the ordinary meeting of which will shortly be held. The Alliance Artificial Silk Co., which was formed in 1928, carried through a drastic capital reduction scheme in May last. The programme for the reconstructed company included the issue of 300,000 6 per cent. participating preferred ordinary shares of £1 each to provide the necessary finance for re-starting operations, but this fresh capital has not, it would appear, been issued.

Petroleum Oils

Optical Density Colour Measurement

THE colour scales previously used for petroleum fractions other than gasolines and naphthas are being discussed by S. W. Ferris and J. M. McIlrain at the Chicago meeting of the American Chemical Society, September 10-15. It is being shown that, from the viewpoint of the refiner, each has one or more disadvantages. The requirements of a satisfactory scale are stated and the experimental steps are presented which led to the development of a colour scale meeting these requirements. The new scale, which is based on the determination of the optical density of the sample in monochromatic green light is shown to be accurate, additive, and reproducible. Data are presented which orient the new scale with those previously used and demonstrate that it can be applied to a wide range of materials.

Inventions in the Chemical Industry

Specifications Accepted and Applications for Patents

THE following information is prepared from the Official Patents Journal. Printed copies of Specifications accepted may be obtained from the Patent Office, 25 Southampton Buildings, London, W.C.2, at 1s. each. The numbers given under "Applications for Patents" are for reference in all correspondence up to the acceptance of the Complete Specification.

Refining Hydrocarbon Oils

HYDROCARBONS produced by destructive-hydrogenisation, *e.g.*, benzene, and illuminating, Diesel, and lubricating oils, are purified by washing with aqueous alkaline solutions under pressure after the hydrogen has been separated off but before the oils contact with air or oxygen. Caustic soda, caustic potash, ammonia, sodium carbonate, and sodium plumbite with or without added sodium hydrate or carbonate are specified reagents; 2 to 15 per cent. is a suitable strength. For example, middle oil obtained by the low temperature carbonisation of brown coal is led with hydrogen at 200 atmospheres and 425° C. over a tungsten sulphide catalyst; the product, 70 per cent. of which boils below 180° C., is stripped of middle oil and condensed, the pressure reduced to 20 atmospheres, and the product passed upwards over Raschig rings against a descending 5 per cent. solution of caustic soda. The benzene is finally passed into a second tower in which it is washed with water at atmospheric pressure. (See Specification No. 391,283, of J. Y. Johnson.)

Hydrogenation Catalysts

HYDROGENATION catalysts are obtained by causing an inorganic gel such as silica gel to adsorb a metallic compound in the vapour or liquid phase or from a solution or dispersion in a non-aqueous and non-hygroscopic medium. Examples of volatilisable compound are molybdenum pentachloride, molybdenyl dihydroxydichloride, molybdenum trioxide, molybdenum trichloride, and molybdenyl trichloride. They may be prepared in presence of the gel or immediately before passing over the gel; *e.g.*, the pentachloride may be obtained by passing carbon tetrachloride vapour over the trioxide. Liquid or fusible compounds are molybdenum pentachloride, phosphatomolybdic acid, and magnesium permolybdate. Solutions which may be used are molybdenyl dihydroxychloride and chloroaquomolybdous acid in ether, molybdenum pentachloride in chloroform, molybdenum dioxodichloride in ether and higher alcohols and molybdenum blue in ether and higher alcohols. (See Specification No. 391,988, of R. A. A. Taylor.)

Specifications Accepted with Dates of Application

DETERGENT AGENTS.—Imperial Chemical Industries, Ltd., A. W. Baldwin and H. M. Bunbury. Feb. 9, 1932. 398,818.
MANUFACTURE OF CELLULOSE OR CELLULOSE MATERIALS.—H. Dreyfus. Feb. 16, 1932. 398,801.
COLOURATION OF MATERIALS MADE OF OR CONTAINING CELLULOSE ESTERS OR ETHERS.—British Celanese, Ltd., and G. H. Ellis. March 12, 1932. 398,842.
NITROGENISATION OF FERROUS AUSTENITIC ALLOYS.—Soc. Anon. Commentry, Fourchambault, et Decazeville. March 14, 1931. 398,834.
MANUFACTURE OF INSOLUBLE AZO DYESTUFFS ON THE FIBRE.—W. W. Groves (I. G. Farbenindustrie). March 17, 1932. 398,846.
SAPONIFICATION OF WAXES AND SEPARATION OF THE ALCOHOLS THEREFROM.—Imperial Chemical Industries, Ltd., W. A. Sexton and D. Ward. March 17, 1932. 398,807.
MANUFACTURE OF NEW AZO DYESTUFFS AND INTERMEDIATE PRODUCTS.—A. Carpmal (I. G. Farbenindustrie). March 22, 1932. 398,854.
MANUFACTURE OF LAMINATED NON-SPLINTERING GLASS.—Imperial Chemical Industries, Ltd., and A. Renfrew. March 22, 1932. 398,855.
PROCESS OF DYEING.—G. E. Burgess, Burgess, Ledward and Co., Ltd., and Brown and Adam, Ltd. March 25, 1931. 398,887.
MANUFACTURE OF TRISODIUM PHOSPHATE.—Grasselli Chemical Co. March 26, 1931. 398,888.
MANUFACTURE OF ARYLISOTHAZOLONES.—A. Carpmal (I. G. Farbenindustrie). May 3, 1932. 398,947.
ALKALINE TREATMENT BATHS FOR VEGETABLE AND REGENERATED CELLULOSE FIBRES.—M. Freiberger. May 21, 1932. 398,958.
MANUFACTURE AND PRODUCTION OF ALCOHOLS.—J. Y. Johnson (I. G. Farbenindustrie). July 11, 1932. 398,982.
PURIFICATION OF VISCOUS LUBRICATING OILS BY LIQUID SULPHUR DIOXIDE.—Edelneau Ges. Dec. 30, 1931. 398,992.
PROCESS FOR OBTAINING SULPHUR FROM SPENT GAS PURIFICATION MASSES.—H. Deneke. Jan. 26, 1932. 399,069.
MANUFACTURE OF ANTHRAQUINONE DERIVATIVES.—I. G. Farbenindustrie. Feb. 23, 1932. 399,095.

PROCESS AND APPARATUS FOR THE PREPARATION, WITH OR WITHOUT PRESSURE, OF HYDROGEN.—G. F. Jaubert. March 29, 1932. 399,110.

Complete Specifications Open to Public Inspection

CATALYTIC MATERIALS AND PROCESS OF MANUFACTURE.—Houdry Process Corporation. March 23, 1932. 3349/33.
PROCESS OF PREPARING ALKYLATED PHENOLS.—Röhm and Haas Co. March 23, 1932. 5676/33.
MANUFACTURE OF AMMONIUM CHLORIDE AND SODIUM CARBAMATE.—Mathieson Alkali Works. March 24, 1932. 6414/33.
METHOD OF MAKING THE MONOALKYLETHERS OF PROTocatechuic ALDEHYDE.—J. D. Riedel-E. de Haen Akt.-Ges. March 21, 1932. 7237/33.
MANUFACTURE AND PRODUCTION OF NITROGENOUS CONDENSATION PRODUCTS.—I. G. Farbenindustrie. March 19, 1932. 7422/33.
MANUFACTURE OF SYNTHETIC RESINOUS COMPOSITIONS.—E. I. Du Pont de Nemours and Co. March 21, 1932. 8578/33.
PRODUCTION OF DILUTE ACIDS.—I. G. Farbenindustrie. March 24, 1932. 8680-2/33.
PROCESS FOR THE MANUFACTURE OF HALOGENATED ETHANOLS.—I. G. Farbenindustrie. March 23, 1932. 8702/33.
MANUFACTURE OF MATERIALS CONSISTING OF OR CONTAINING POLYMERISATION PRODUCTS OF ACRYLIC ACID OR ITS HOMOLOGUES OR DERIVATIVES OF THESE SUBSTANCES OR MIXTURES THEREOF.—Röhm and Haas Akt.-Ges. March 23, 1932. 8811/33.
MANUFACTURE OF 4-AMINO-1:8-NAPHTHALENE-DICARBOXYLIC ACID IMIDE DERIVATIVES THEREOF.—I. G. Farbenindustrie. March 24, 1932. 8953/33.
PROCESS FOR STABILISING ORGANIC ESTERS OF CELLULOSE.—O. Sindl. March 24, 1932. 9003/33.
MANUFACTURE OF CELLULOSE NITRATE.—Du Pont Viscoloid Co. March 25, 1932. 9056/33.

Applications for Patents

MAKING DIKETONE.—Carbide and Carbon Chemicals Corp. Sept. 30. 26980.
RECOVERY OF SULPHUR DIOXIDE FROM GAS MIXTURES.—A. M. Clark. Sept. 27. 26648.
PRODUCTION OF REACTION PRODUCTS FROM WATER VAPOUR AND OLEFINS.—Distillers Co., Ltd., J. B. Dymock, W. B. Joshua and H. M. Stanley. Sept. 26. 26507.
RESINS, ETC.—N. Drey. Sept. 25. 26330.
MANUFACTURE OF INSECTICIDAL, ETC., MATERIALS.—E. I. Du Pont de Nemours and Co. Sept. 25. 26367, 26368.
MANUFACTURE OF AMINO ALCOHOLS.—E. I. Du Pont de Nemours and Co. Sept. 27. 26651, 26652.
MANUFACTURE OF SALTS OF HYDROXYLATED AMINES.—E. I. Du Pont de Nemours and Co. Sept. 27. 26653.
PRODUCTION OF FINELY-DIVIDED SUBSTANCES, DISPERSIONS, AND EMULSIONS.—E. I. Du Pont de Nemours and Co. Sept. 29. 26858.
PRODUCTION OF AMINO ACIDS FROM MATERIALS CONTAINING KERA-TIN.—C. F. Ferstl. Sept. 29. 26867.
PRODUCTION OF FUEL BY LOW-TEMPERATURE CARBONISATION OF COAL.—Fife Coal Co., Ltd., and G. S. Jenkins. Sept. 29. 26808.
MANUFACTURE OF TANNING SUBSTANCES.—J. R. Geigy A.-G. Sept. 29. 26836.
PROCESS FOR SENSITISING PHOTOGRAPHIC SILVER HALIDE EMULSIONS, ETC.—I. G. Farbenindustrie. Sept. 25. 26377.
MANUFACTURE OF ACID TRIPHENYLMETHANE DYESTUFFS.—I. G. Farbenindustrie. Sept. 28. 26732.
PLASTIC COMPOSITIONS, ETC.—Imperial Chemical Industries, Ltd. Sept. 27. 26645, 26646, 26647.
RECOVERY OF SULPHUR DIOXIDE FROM GAS MIXTURES.—Imperial Chemical Industries, Ltd., Sept. 27. 26648.
MANUFACTURE OF HYDROGEN.—J. Y. Johnson (I. G. Farbenindustrie). Sept. 28. 26729.
CONTINUOUS MANUFACTURE OF PURE CARBON DIOXIDE AND ALKALINE HYDRATES, ETC.—F. Leroy. Sept. 26. 26502.
RECOVERY OF SULPHUR, ETC., FROM MATERIALS.—Metallges A.-G. Sept. 29. 26846, 26847.
PRODUCING DIS-OR POLYAZO DYESTUFFS.—Soc. of Chemical industry in Basle. Sept. 26. 26481.
CONVERSION OF DISTILLATES FROM COAL, ETC., INTO PRODUCTS OF LOWER BOILING POINT.—M. Stuart and A. G. L. Try. Sept. 27. 26637.

Weekly Prices of British Chemical Products

Review of Current Market Conditions

BUSINESS in chemical markets during the past week has continued to improve, quotations generally have been firm and transactions have been conducted over a wider range of products. The most noticeably weak items in the industrial sections were arsenic and barium chloride, potassium salts also being inactive. Anhydrous ammonia and ammonium chloride have enjoyed a fair demand, while the group of products which have been most prominent in the market lately continue strong. These are acetic acid, acetone, formaldehyde, formic acid and oxalic acid. Conventional rates for white lead are subject to withdrawal without notice. The rates were reduced a short time ago by £1 per ton. Most coal tar products continue to give fair satisfaction. Cresylic acid and naphthalene sales are on the up-grade, and in some varieties stocks of creosote oil are hard to find. The weak position of the pitch trade, especially in the export market, continues to give some anxiety. Pharmaceuticals are also in greater demand, particularly aspirin and hexamine. More inquiries have been received for bromides, phenacetin and salicylates. An important price change is the reduced rate for paraldehyde. Reports from the essential oils market denote a fair measure of activity.

LONDON.—The London chemical market continues to receive quite a satisfactory volume of inquiry and the amount of business booked is up to the usual average. There is little change to report in prices, markets continuing exceptionally steady. Conditions in the coal tar products market remain unchanged from last week, and prices remain steady.

MANCHESTER.—The Manchester chemical market during the past week has been reasonably cheerful, the half-year's revenue figures having had a tonic effect. On the whole, the demand for the leading heavy products has been on a fair scale, and although new bookings tend to be restricted in the majority of instances to relatively early requirements, users are specifying for fair quantities of materials against contracts booked some time ago. Certainly, the position generally is rather better than it was a month ago, notwithstanding the difficulties which continue to beset the Lancashire cotton industry. Firmness continues to characterise most sections of the market, the most important move towards lower levels of late being the reduction in white and red lead prices, though this has been offset to some extent by the rise in the acetates of lead. The demand for the potash and soda products this week has been moderately active, but inquiry for both citric and tartaric acids has been less in evidence. Among the by-products, a fairly active business has been reported this week in toluol and solvent naphtha and some of the other light products, but new bookings in the case of pitch has been very moderate. With regard to creosote oil, fair quantities are now moving into consumption, and the position in this section is appreciably better than it was a few months ago.

SCOTLAND.—Buying for immediate requirements is steady and there are no serious changes to report. Few contracts are being placed at the present time and any contracts due for renewal are being placed without difference in price.

General Chemicals

ACETONE.—LONDON: £65 to £68 per ton; SCOTLAND: £66 to £68 ex wharf, according to quantity.

ACID, ACETIC.—Tech. 80%, £38 5s. to £40 5s.; pure 80% £39 5s.; tech. 40%, £20 5s. to £21 15s.; tech. 60%, £28 10s. to £30 10s. LONDON: Tech. 80%, £38 5s. to £40 5s.; pure 80%, £39 5s. to £41 5s.; tech. 40%, £20 5s. to £22 5s.; tech. 60%, £29 5s. to £31 5s. SCOTLAND: Glacial 98/100%, £48 to £52; pure 80%, £39 5s.; tech. 80%, £38 5s. d/d buyers' premises Great Britain. MANCHESTER: 80%, commercial, £39; tech. glacial, £52.

ACID, BORIC.—SCOTLAND: Granulated commercial, £26 10s. per ton; B.P. crystals, £35 10s.; B.P. powder, £36 10s. in 1-cwt. bags d/d free Great Britain in 1-ton lots upwards.

ACID CHROMIC.—10jd. per lb., less 2½%, d/d U.K.

ACID, CITRIC.—LONDON: 9jd. per lb.; less 5%. MANCHESTER: 9jd.

ACID, CRESYLIC.—97/99%, 1s. 1d. to 1s. 7d. per gal.; 98/100%, 1s. 5d. to 2s.

ACID, FORMIC.—LONDON: £47 10s. per ton.

ACID, HYDROCHLORIC.—Spot, 4s. to 6s. carboy d/d according to purity, strength and locality. SCOTLAND: Arsenical quality, 4s.; dearsenicated, 5s. ex works, full wagon loads.

ACID, LACTIC.—LANCASHIRE: Dark tech., 50% by vol., £24 10s. per ton; 50% by weight, £28 10s.; 80% by weight, £48; pale tech., 50% by vol., £28; 50% by weight, £33; 80% by weight, £53; edible, 50% by vol., £41. One-ton lots ex works, barrels free.

ACID, NITRIC.—80° Tw. spot, £18 to £25 per ton makers' works, according to district and quality. SCOTLAND: 80°, £23 ex station full truck loads.

ACID, OXALIC.—LONDON: £47 7s. 6d. to £57 10s. per ton, according to packages and position. SCOTLAND: 98/100%, £49 to £52 ex store. MANCHESTER: £48 to £53 ex store.

ACID, SULPHURIC.—Average prices f.o.r. British makers' works, with slight variations owing to local considerations; 140° Tw. crude acid, £3 per ton; 168° Tw. arsenical £5 10s.; 168° Tw. non-arsenical, £6 15s. SCOTLAND: 144° quality, £3 12s. 6d.; 168°, £7; dearsenicated, 20s. per ton extra.

ACID, TARTARIC.—LONDON: 11d. per lb. SCOTLAND: B.P. crystals, 11d., carriage paid. MANCHESTER: 11½d. to 1s.

ALUM.—SCOTLAND: Lump potash, £9 per ton ex store.

ALUMINA SULPHATE.—LONDON: £8 5s. to £9 10s. per ton. SCOTLAND: £8 to £8 10s. ex store.

AMMONIA, ANHYDROUS.—Spot, 10d. per lb. d/d in cylinders. SCOTLAND: 10d. to 1s. containers extra and returnable.

AMMONIA LIQUID.—SCOTLAND: 80°, 2jd. to 3d. per lb., d/d.

AMMONIUM BICARBONATE.—8d. per lb. d/d U.K.

AMMONIUM CARBONATE.—SCOTLAND: Lump, £32 per ton; powdered, £34, in 5-cwt. casks d/d buyers' premises U.K.

AMMONIUM CHLORIDE.—£37 to £45 per ton, carriage paid. LONDON: Fine white crystals, £19 to £20. (See also Salammoniac.) AMMONIUM CHLORIDE (MURIATE).—SCOTLAND: British dog tooth crystals, £32 to £35 per ton carriage paid according to quantity. (See also Salammoniac.)

ANTIMONY OXIDE.—SCOTLAND: Spot, £26 per ton, c.i.f. U.K. ports. ANTIMONY SULPHIDE.—Golden 6jd. to 1s. 1jd. per lb.; crimson, 1s. 3d. to 1s. 5d. per lb., according to quality.

ARSENIC.—LONDON: £17 c.i.f. main U.K. ports for imported material; Cornish nominal, £22 10s. f.o.r. mines. SCOTLAND: White powdered, £23 ex wharf. MANCHESTER: White powdered Cornish, £22 10s. at mines.

ARSENIC SULPHIDE.—Yellow, 1s. 5d. to 1s. 7d. per lb.

BARIUM CHLORIDE.—£11 per ton.

BISULPHITE OF LIME.—£6 10s. per ton f.o.r. London.

BLEACHING POWDER.—Spot 35/37% £7 19s. per ton d/d station in casks, special terms for contract. SCOTLAND: £8 15s. in 5/6 cwt. casks.

BORAX, COMMERCIAL.—Granulated, £15 10s. per ton; powder, £17 packed in 1-cwt. bags, carriage paid any station Great Britain. Prices are for 1-ton lots and upwards.

CADMIUM SULPHIDE.—2s. 8d. to 3s.

CALCIUM CHLORIDE.—Solid 70/75% spot, £5 5s. per ton d/d station in drums.

CARBON BISULPHIDE.—£30 to £32 per ton, drums extra.

CARBON BLACK.—3d. to 4jd.

CARBON TETRACHLORIDE.—£41 to £46 per ton, drums extra.

CHROMIUM OXIDE.—10jd. per lb., according to quantity d/d U.K. Green, 1s. 2d. per lb.

CHROMETAN.—Crystals, 3jd. per lb. Liquor, £19 10s. per ton d/d.

COPPERAS (GREEN).—SCOTLAND: £3 15s. per ton, f.o.r. or ex works.

CREAM OF TARTAR.—LONDON: £4 per cwt.

DINITROTOLUENE.—66/68° C., 9d. per lb.

DIPHENYLGUANIDINE.—2s. 2d. per lb.

FORMALDEHYDE.—LONDON: £28 per ton. SCOTLAND: 40%, £28 ex store.

LAMPBLACK.—£45 to £48 per ton.

LEAD ACETATE.—LONDON: White, £35 per ton; brown, £1 per ton less. SCOTLAND: White crystals, £33 to £35; brown, £1 per ton less. MANCHESTER: White, £34 to £36; brown, £33 to £35.

LEAD NITRATE.—£28 per ton.

LEAD, RED.—SCOTLAND: £25 10s. to £28 per ton d/d buyer's works.

LEAD, WHITE.—SCOTLAND: £39 per ton, carriage paid.

LITHOPONE.—30%, £17 10s. to £18 per ton.

MAGNESITE.—SCOTLAND: Ground Calcined £9 per ton ex store.

METHYLATED SPIRIT.—61 O.P. Industrial 1s. 8d. to 2s. 3d. per gal.

Pyridinised Industrial, 1s. 10d. to 2s. 5d. Mineralised, 2s. 9d. to 3s. 3d. 64 O.P. 1d. extra in all cases. Prices according to quantities. SCOTLAND: Industrial 64 O.P., 1s. 9d. to 2s. 4d.

NICKEL AMMONIUM SULPHATE.—£49 per ton d/d.

NICKEL SULPHATE.—£49 per ton d/d.

PHENOL.—9d. to 10d. per lb. nominal.

POTASH, CAUSTIC.—LONDON: £42. MANCHESTER: £40.

POTASSIUM BICARBONATE.—Crystals and Granular, 5d. per lb. net d/d U.K. Discount according to quantity. Ground 5jd. LONDON: 5d. per lb. with usual discounts for contracts. SCOTLAND: 5d. d/d U.K. or c.i.f. Irish Ports. MANCHESTER: 5d.

POTASSIUM CHLORATE.—LONDON: £37 to £40 per ton. SCOTLAND: 99½/100%, powder, £37. MANCHESTER: £38.

POTASSIUM CHROMATE.—6jd. per lb. d/d U.K.

POTASSIUM NITRATE.—SCOTLAND: Refined Granulated £29 per ton c.i.f. U.K. ports. Spot, £30 per ton ex store.

POTASSIUM PERMANGANATE.—LONDON: 8½d. to 9d. per lb. SCOTLAND: B.P. crystals, 8½d. MANCHESTER: Commercial, 8½d., B.P., 8½d.

POTASSIUM PRUSSATE.—LONDON: 8½d. to 8¾d. per lb. SCOTLAND: Yellow spot material, 8½d. ex store. MANCHESTER: Yellow, 8½d.

SALAMMONIAC.—First lump spot, £42 17s. 6d. per ton d/d in barrels.

SODA ASH.—58% spot, £5 17s. 6d. per ton f.o.b. in bags, special terms for contracts.

SODA CAUSTIC.—Solid 76/77° spot, £14 5s. per ton d/d station. SCOTLAND: Powdered 98/99%, £17 10s. in drums, £18 15s. in casks, Solid 76/77%, £14 10s. in drums; 70/73%, £14 12s. 6d., carriage paid buyer's station, minimum 4-ton lots; contracts 10s. per ton less. MANCHESTER: £13 5s. to £14 10s. contracts.

SODA CRYSTALS.—Spot, £5 to £5 5s. per ton d/d station or ex depot in 2-cwt. bags.

SODIUM ACETATE.—£22 per ton. LONDON: £23.

SODIUM BICARBONATE.—Refined spot, £10 10s. per ton d/d station in bags. SCOTLAND: Refined recrystallised £10 10s. ex quay or station. MANCHESTER: £10 10s.

SODIUM BICROMATE.—Crystals cake and powder 4d. per lb. net d/d U.K. discount according to quantity. Anhydrous, 5d. per lb. LONDON: 4d. per lb. with discounts for quantities. SCOTLAND: 4d. delivered buyer's premises with concession for contracts. MANCHESTER: 4d. less 1 to 3½% contracts, 4d. spot lots.

SODIUM BISULPHITE POWDER.—60/62%, £16 10s. per ton d/d 1-cwt. iron drums for home trade.

SODIUM CARBONATE (SODA CRYSTALS).—SCOTLAND: £5 to £5 5s. per ton ex quay or station. Powdered or pea quality 7s. 6d. per ton extra. Light Soda Ash £7 ex quay, min. 4-ton lots with reductions for contracts.

SODIUM CHLORATE.—£33 per ton.

SODIUM CHROMATE.—3½d. per lb. d/d U.K.

SODIUM HYPOSULPHITE.—SCOTLAND: Large crystals English manufacture, £9 5s. per ton ex stations, min. 4-ton lots. Pea crystals, £15 ex station, 4-ton lots. MANCHESTER: Commercial, £9 5s.; photographic, £15.

SODIUM NITRITE.—LONDON: Spot, £18 to £20 per ton d/d station in drums.

SODIUM PERBORATE.—LONDON: 10d. per lb.

SODIUM PHOSPHATE.—£12 10s. per ton.

SODIUM PRUSSATE.—LONDON: 5d. to 5½d. per lb. SCOTLAND: 5d. to 5½d. ex store. MANCHESTER: 4½d. to 5½d.

SODIUM SILICATE.—140° Tw. Spot £8 5s. per ton d/d station, returnable drums.

SODIUM SULPHATE (GLAUBER SALTS).—£4 2s. 6d. per ton d/d. SCOTLAND: English material £3 15s.

SODIUM SULPHATE (SALT CAKE).—Unground Spot, £3 15s. per ton d/d station in bulk. SCOTLAND: Ground quality, £3 5s. per ton d/d. MANCHESTER: £3 5s.

SODIUM SULPHIDE.—Solid 60/62% Spot, £10 15s. per ton d/d in drums; crystals 30/32%, £8 per ton d/d in casks. SCOTLAND: For home consumption, Solid 60/62%, £10 5s.; broken 60/62%, £11 5s.; crystals, 30/32%, £8 2s. 6d. d/d buyer's works on contract, min. 4-ton lots. Spot solid 5s. per ton extra. Crystals, 2s. 6d. per ton extra. MANCHESTER: Concentrated solid, 60/62%, £11; commercial, £8.

SODIUM SULPHITE.—Pea crystals spot, £13 10s. per ton d/d station in kegs. Commercial spot, £9 10s. d/d station in bags.

SULPHATE OF COPPER.—MANCHESTER: £16 10s. per ton f.o.b.

SULPHUR.—£11 10s. per ton. SCOTLAND: Flowers, £11; roll, £10 10s.; rock, £9; ground American, £10 ex store.

SULPHUR CHLORIDE.—5d. to 7d. per lb., according to quality.

SULPHUR PRECIP.—B.P. £55 to £60 per ton according to quantity. Commercial, £50 to £55.

VERMILION.—Pale or deep, 4s. 3d. to 4s. 5d. per lb.

ZINC CHLORIDE.—SCOTLAND: British material, 98%, £18 10s. per ton f.o.b. U.K. ports.

ZINC SULPHATE.—LONDON and SCOTLAND: £12 per ton.

ZINC SULPHIDE.—11d. to 1s. per lb.

Pharmaceutical and Fine Chemicals

IRON QUININE CITRATE B.P.—10½d. to 11½d. per oz.

PARALDEHYDE.—1s. 3½d. to 1s. 9d. per lb.

QUININE SULPHATE.—2s. per oz.

SODIUM BARBITONUM.—13s. to 15s. per lb.

SODIUM BENZOATE, B.P.—1s. 9d. to 2s. 3d. per lb.

ZINC STEARATE.—1s. 3d. to 1s. 8d. per lb.

Essential Oils

BOURBON GERANIUM.—24s. 3d. per lb.

CITRONELLA, JAVA.—2s. 4d. per lb.

LAVENDER, MONT BLANC, 38/40%.—16s. per lb.

Intermediates and Dyes

IN the following list of intermediates delivered prices include packages except where otherwise stated:—

ACID, BENZOIC, 1914 B.P. (ex Toluol).—1s. 9½d. per lb.

ACID, GAMMA.—Spot, 4s. per lb. 100% d/d buyer's works.

ACID, H.—Spot, 2s. 4½d. per lb. 100% d/d buyer's works.

ACID, NEVILLE AND WINTHER.—Spot, 3s. per lb. 100% d/d buyer's works.

ACID, SULPHANILIC.—Spot, 8d. per lb. 100% d/d buyer's works.

ANILINE OIL.—Spot, 8s. per lb., drums extra, d/d buyer's works.

ANILINE SALTS.—Spot, 8s. per lb. d/d buyer's works, casks free.

BENZALDEHYDE.—Spot, 1s. 8d. per lb., packages extra.

BENZIDINE BASE.—Spot, 2s. 5d. per lb. 100% d/d buyer's works.

p-CRESOL 34.5° C.—1s. 9d. per lb. in ton lots.

m-CRESOL 98/100%.—2s. 3d. per lb. in ton lots.

DICHLORANILINE.—2s. 3d. per lb.

DIMETHYLANILINE.—Spot, 1s. 6d. per lb., package extra.

DINITROBENZENE.—8d. per lb.

DINITROTOLUENE.—48/50° C., 8d. per lb.; 66/68° C. 8½d. per lb.

DIPHENYLAMINE.—Spot, 2s. per lb., d/d buyer's works.

α-NAPHTHOL.—Spot, 2s. 4d. per lb., d/d buyer's works.

β-NAPHTHOL.—Spot, £78 15s. per ton in paper bags; £79 15s. in casks, in 1-ton lots.

α-NAPHTHYLAMINE.—Spot, 11½d. per lb., d/d buyer's works.

β-NAPHTHYLAMINE.—Spot, 2s. 9d. per lb. d/d buyer's works.

o-NITRANILINE.—5s. 10d. per lb.

m-NITRANILINE.—Spot, 2s. 7d. per lb. d/d buyer's works.

p-NITRANILINE.—Spot, 1s. 8d. per lb. d/d buyer's works.

NITROBENZENE.—Spot, 4½d. per lb.; 3-cwt. lots, drums extra.

NITRONAPHTHALENE.—9d. per lb.

SODIUM NAPHTHIONATE.—Spot, 1s. 9d. per lb.

o-TOLUIDINE.—Spot, 9½d. per lb., drums extra, d/d buyer's works.

p-TOLUIDINE.—Spot, 1s. 11d. per lb., d/d buyer's works.

m-XYLIDINE ACETATE.—3s. 4d. per lb.

Coal Tar Products

ACID, CARBOLIC.—Crystals, 9d. to 10d. per lb.; crude, 60's, 2s. 5d. to 2s. 6d. per gal. MANCHESTER: Crystals, 9d. per lb.; crude, 2s. 7d. per gal. SCOTLAND: 60's, 2s. 6d. to 2s. 7d.

ACID, CRESYLIC.—90/100%, 1s. 6d. to 1s. 8d. per gal.; pale, 98%, 1s. 4d. to 1s. 5d.; pale 95%, 11d. to 11½d.; dark, 10d., all according to specification; refined, 1s. 8d. to 1s. 9d. LONDON: 98/100%, 1s. 3d.; dark, 95/97%, 11d. SCOTLAND: Pale, 99/100%, 1s. 3d. to 1s. 4d.; 97/99%, 1s. to 1s. 1d.; dark, 97/99%, 11d. to 1s.; high boiling acid, 2s. 6d. to 3s.

ANTHRACENE OIL.—Strained, 4½d. per gal.

BENZOL.—At works, crude, 9d. to 9½d. per gal.; standard motor 1s. 4d. to 1s. 4½d.; 90%, 1s. 5d. to 1s. 6d.; pure, 1s. 7½d. to 1s. 8d. LONDON: Motor, 1s. 6½d. SCOTLAND: Motor, 1s. 6½d. to 1s. 7½d.; 90%, 2s. 0½d. to 2s. 1½d.

NAPHTHA.—Solvent, 90/160%, 1s. 4d. to 1s. 5d. per gal.; 95/160%, 1s. 8d.; 99/190%, 11d. to 1s. 1d. LONDON: Solvent, 1s. 3½d. to 1s. 4d.; heavy, 11d. to 1s. 0½d. f.o.b. SCOTLAND: 90/160%, 1s. 3d. to 1s. 3½d.; 90/190%, 11d. to 1s. 2d.

NAPHTHALENE.—Crude, Hot-Pressed, £6 1s. 3d. per ton. Flaked, £10 per ton. Purified crystals, £9 10s. per ton in bags. LONDON: Fire lighter quality, £3 to £3 10s.; 74/76 quality, £4 to £4 10s.; 76/78 quality, £5 10s. to £6. SCOTLAND: 40s. to 50s.; whizzed, 70s. to 75s.

PITCH.—Medium soft, £3 15s. to £4 per ton. MANCHESTER: £3 15s. to £4 f.o.b. LONDON: £3 15s. f.o.b. East Coast port for next season's shipment.

PYRIDINE.—90/140, 4s. 3d. to 5s. 6d. per gal.; 90/180, 2s. to 2s. 6d. SCOTLAND: 90/160%, 4s. to 5s.; 90/220%, 1s. 9d. to 2s. naked.

REFINED COAL TAR.—SCOTLAND: 4d. per gal.

TOLUOL.—90%, 2s. 4d. per gal.; pure, 2s. 9d.

XYLOL.—Commercial, 2s. 2d. to 2s. 3d. per gal.; pure, 2s. 4d.

Nitrogen Fertilisers

SULPHATE OF AMMONIA.—Home, £6 15s. per ton delivered in 6-ton lots to farmer's nearest station; export, £6 8s. 9d. f.o.b. U.K. ports in single bags.

CYANAMIDE.—£7 per ton, carriage paid to any railway station in Great Britain in lots of 4 tons and over.

NITRATE OF SODA.—£7 8s. 6d. per ton delivered in 6-ton lots to farmer's nearest station.

NITRO-CHALK.—£7 5s. per ton delivered in 6-ton lots to farmer's nearest station.

Latest Oil Prices

LONDON, Oct. 4.—LINSFED OIL was erratic. Spot, £20 (small quantities, 30s. extra); Oct., £18 10s.; Nov.-Dec., £18 12s. 6d.; Jan.-April, £18 17s. 6d., naked. RAPE OIL was neglected. Crude extracted, £28; technical refined, £29 10s., naked, ex wharf. COTTON OIL was dull. Egyptian crude, £18; refined common edible, £20 10s., and deodorised, £22, naked, ex mill. TURPENTINE was steadier. American, spot, 47s. 9d. per cwt.

HULL.—LINSFED OIL.—Spot, quoted £19 per ton; Oct., £18 10s.; Oct.-Dec., £18 15s.; Jan.-April, £19. COTTON OIL.—Egyptian, crude, spot, £17; edible, refined, spot, £19 10s.; technical, spot, £19 10s.; deodorised, £21 10s., naked. PALM KERNEL OIL.—Crude, f.m.q., spot, £17 10s., naked. GROUNDNUT OIL.—Extracted, spot, £22; deodorised, £26. RAPE OIL.—Extracted, spot, £27; refined, £28 10s. SOYA OIL.—Extracted, spot, £19 10s.; deodorised, £22 10s. per ton. COP OIL, 21s. per cwt., nominal. CASTOR OIL.—Pharmaceutical, 37s.; first, 32s.; second, 29s. per cwt. TURPENTINE.—American, spot, 49s. 6d. per cwt.

Company News

Wright, Layman & Umney (1932).—A dividend of 2½ per cent. is announced on the ordinary shares payable on September 30.

Edgar Allen & Co.—Payment on the cumulative preference shares in respect of the half-year ending September 30 has been deferred. The directors state it is still necessary to conserve resources in view of the continued trade uncertainty.

Lafarge Aluminous Cement Co.—For the year ended March 31, 1933, there was a profit of £10,434, which the directors recommend be carried forward in reduction of the debit balance on profit and loss account.

Burt, Bolton & Haywood, Ltd.—An ordinary dividend of 3½ per cent., less tax, is announced for the year ended June 30 last, payable on October 13. The annual meeting will be held at Brettenham House, Wellington Street, London, on October 12, at 12 noon.

Dunlop Rubber Co.—The directors announce that the question of the dividend on the ordinary shares will be considered when the results of the full year's working are ascertained. Interim payments on the "A," "B," and "C" preference shares are to be made on October 31.

Taylor's (Cash Chemists), London.—The directors have declared a further dividend of 1½ per cent., less tax, in respect of arrears of dividend on the 7½ per cent. cumulative preferred ordinary shares to September 30, 1933. As soon as the accounts for the year ended September 30 have been prepared, it is stated that a scheme for the re-arrangement of the capital of the company will be submitted by the directors.

Murex, Ltd.—The report for the year ended June 30 last states that the trading profit amounts to £69,583, compared with £54,526 a year ago. Dividends and interest, discounts and transfer fees amount to £9,138, making a gross total of £78,721. The balance of profit and loss, after all expenses, is £68,677, to which is added £34,204 brought forward, making an available total of £102,881. The directors recommend a final dividend of 20 per cent., less income tax, making 30 per cent. for the year.

Forthcoming Events

- Oct. 9.**—The Ceramic Society. Spode Bi-Centenary meeting. "Josiah Spode—His Times and Triumphs." J. Thomas. 7.30 p.m. North Staffordshire Technical College, Stoke-on-Trent.
- Oct. 9.**—Society of Chemical Industry (London Section). "Tung Oil, Chemical Studies and Specifications." Dr. L. A. Jordan. "Application of Fungicides to Warehouses." Dr. A. B. Page. 8 p.m. Burlington House, London.
- Oct. 10.**—Institution of Petroleum Technologists. "The Modern High-Speed Diesel Engine and its Place in Road Transport." Major W. H. Goddard. 5.30 p.m. John Street Adelphi, London.
- Oct. 10.**—The Institute of Chemistry (Huddersfield Section). "The Use of Dyes in the Photographic Industry." Dr. H. Baines. Huddersfield.
- Oct. 11.**—Institute of Fuel. Melchett Lecture. "The Place of Oil in the World of Fuel." Sir John Cadman. 8.30 p.m. Geological Society, Burlington House, London.
- Oct. 11.**—The Television Society. "Television at the 1933 Berlin Radio Exhibition." Ernest H. Traub. 7 p.m. University College, Gower Street, London.
- Oct. 11.**—Institute of Fuel (N.W. Section). "The Fuel Industry and the Need for Co-ordination." E. Watson Smyth.
- Oct. 12.**—Association of British Chemical Manufacturers. Annual Dinner. 7.15 for 7.45 p.m. Grosvenor House, Park Lane, London.
- Oct. 12.**—Institution of Chemical Engineers. Joint meeting with the Diesel Engine Users' Association. "The Treatment of Cooling Water for Diesel Engines." L. O. Newton. 3 p.m. Caxton Hall, Westminster, London.
- Oct. 12.**—Oil and Colour Chemists' Association. "Alchemists in Art and Literature." Richard B. Pilcher. Palace Hotel, Bloomsbury Street, London.
- Oct. 12.**—Chemical Engineering Group. "Canning Fruit and Vegetables." George Cadbury. 8 p.m. Burlington House, London.
- Oct. 12.**—British Association of Chemists. Scottish Section. Social Evening. 7.30 p.m.
- Oct. 12.**—Institute of Chemistry, Manchester Section. "The Properties of Groups in the Benzene Nucleus." Dr. Buckhardt. 7 p.m. Queen's Hotel, Manchester.
- Oct. 13.**—Oil and Colour Chemists' Association (Manchester Section). Discussion on Co-operative Research, opened by J. A. F. Wilkinson, Manchester.
- Oct. 14.**—Institute of Chemistry (Bristol Section). Social Meeting on the invitation of Dr. A. C. Fryer.

Chemical Trade Inquiries

British India.—The Director-General, Indian Stores Department, Belvedere Road, Lambeth, London, S.E.1, invites tenders for 64 tons caustic soda. Tenders due October 13, 1933. Forms of tender obtainable from the above at a fee (which will not be returned) of 5s.

Canada.—A firm of manufacturers' agents in Montreal handling raw materials and supplies for the textile mills, paint makers, pulp and paper mills, rubber manufacturers and wire and cable works, desires to obtain United Kingdom agencies for the sale of salt cake, slab alum, barytes, china clay on a commission basis, in the Provinces of Quebec and Ontario. (Ref. No. 379.)

Finland.—A firm in Helsingfors wishes to represent United Kingdom manufacturers and suppliers of red earth, zinc white, etc. (Ref. No. 392.)

India.—The British Trade Commissioner at Calcutta reports that the Indian Stores Department is calling for tenders to be presented in New Delhi by October 30, 1933, for the supply of lubricating oils and greases during the year ending February 28, 1935. (Ref. B.Y.7673.)

India.—The Indian Stores Department is calling for tenders to be presented in New Delhi by October 23, 1933, for the supply of turpentine, turpentine substitute and rosin. The approximate quantities required are: Turpentine genuine 27,000 gal, turpentine substitute 22,000 gal., rosin 240 cwt. (Ref. No. B.Y.7674.)

India.—The Indian Stores Department is calling for tenders to be presented in New Delhi by November 2, 1933, for the supply of wood preservatives. (Ref. No. B.Y.7676.)

India.—The Indian Stores Department is calling for tenders to be presented in New Delhi by October 26, 1933, for the supply of approximately 23,700 gal. of raw linseed oil and 96,000 gal. of linseed oil double boiled. (Ref. No. B.Y.7677.)

New Companies Registered

Cooper, McDougall & Robertson (Ireland), Ltd.—Registered in Dublin, September 18. Nominal capital £1,000 in 50 preference shares of £10 each and 500 ordinary shares of £1 each. Manufacturing agricultural and general chemists, and manufacturers of and retail dealers in all descriptions of sheep dips and cattle dressings, drugs and disinfectants. Directors: J. Gibbs, Pennallow, Rickmansworth Road, Watford, Hertfordshire; N. J. D. Pagden; Edward R. Phillips and Sir R. A. Cooper, Bart.

General Technical Consulting Co., Ltd., New Courts Chambers, 57/8 Chancery Lane, W.C.2. Registered October 2. Nominal capital, £600 in 5s. shares. Consultants in all general technical matters, expert advisers and assistants, advisers and assistants in all matters of civil, electrical, mechanical, chemical and other forms of engineering, technical, research and analytical chemists, etc. Subscribers: J. H. N. Garvin, 262 Mitcham Road, Tooting, S.W.17; and E. M. Joyce.

London Moulders, Ltd.—Registered September 21. Nominal capital £10,000 in £1 shares (7,000 5 per cent. cumulative preference and 3,000 ordinary). Producers, manufacturers, distributors, importers, and exporters of and dealers in chemical products of all kinds, resins, synthetic or artificial resins, gums, enamels, cements, lutes, adhesives, glass, china, porcelain and meerschaum and mouldings, made therefrom. Directors: A. S. Ferdinando, East Hill, Bickley, Kent; H. B. Spencer, and Cecil J. V. Spencer.

Santras, Ltd., 16/18 Whiteford Street, Liverpool. Registered September 30. Nominal capital, £100 in £1 shares. To adopt an agreement with G. E. Travis and T. H. Sanders, for the acquisition of the rights, interests and royalties and patents in connection therewith referred to therein, and to carry on the business of grease makers and refiners, soap boilers and makers, tallow melters and refiners, manufacturers of and dealers in lubricants, disinfectants, oils, fats, tallow, perfumes, etc. Directors: G. E. Travis, 67 Town Row, West Derby, Liverpool; T. H. Sanders and W. R. Glenn.

The Liverpool Borax Co. (1933), Ltd., 43 Castle Street, Liverpool. Registered as a public company on September 25. Nominal capital, £65,000 in £1 shares (35,000 8 per cent. cumulative preference and 30,000 ordinary). To acquire the business of the Liverpool Borax Co., Ltd., and to carry on the business of borax and soap manufacturers, soap boilers, manufacturing chemists, explosive manufacturers, mechanical and water supply engineers, civil or consulting engineers, etc. Directors (to number not less than 3 nor more than 7): J. L. Williams, 25 Water Street, Liverpool; C. H. Nelson; T. Henderson; H. W. Bannister; W. H. Crowe; and G. E. Barlow.

From Week to Week

BRITISH SUMMER TIME ends at 2 a.m. to-morrow (Sunday). All clocks should be put back one hour to-night.

A NEW FACTORY with a contemplated annual output of 6,000 tons of crude rosin is about to commence operation at Wologda, in Eastern Russia.

A SEAM OF BARYTES has been located at Cashelane, Durrus, County Cork, and boring operations are now being carried out with a view to the commercial exploitation of the deposit.

DORMAN LONG AND CO., LTD., are anticipating increased activity on Tees-side. Coke ovens are being prepared for the re-opening of Redcar Ironworks, and work may shortly be resumed at Acklam Steelworks.

MR. PERCY H. MILLS, who has for some years occupied the position of general manager of W. and T. Avery, Ltd., has been appointed managing director of the firm, to fill the vacancy created by the death of Sir Gilbert Vyle.

ARRANGEMENTS HAVE BEEN MADE by the Food Group of the Society of Chemical Industry to hold a symposium on the subject of "Bread and Milk" in the hall of the British Medical Association, Tavistock Place, W.C.1, on November 23 and 24.

THE NOMINAL CAPITAL OF CREPE YARNS, LTD., Lowestoft, has been increased by £124,000 beyond the registered capital of £1,000. Crepe Yarns, Ltd., was formed in August to operate the viscose crepe section of the Alliance Artificial Silk, Ltd., factory at Lowestoft.

THE INSTITUTION OF CHEMICAL ENGINEERS' lecture of the year will be delivered by Professor G. T. Morgan at the Institution of Civil Engineers, Great George Street, S.W.1, on October 27. Professor Morgan will talk on engineering in the service of chemical research.

DISCUSSION ON THE NITRATE REFORM BILL, now before the Chilean Parliament, was begun on Monday. Amendments which have been introduced include provision for the increase of the production percentage to be entrusted to Chilean interests, and for the increase of the Government share in the profits.

AMONG RECENT WILLS PROVED are those of Mr. Edward O. Windel, Wallasey, Cheshire, analytical chemist, £48,032 (net personalty £47,881); Sir Richard Threlfall, Birmingham, engineer, physicist and chemist, settled land valued at £5,460, which with unsettled property makes the total estate £62,593.

MR. CECIL WALTON, editor of "Port Sunlight News" and general adviser on labour affairs to Lever Bros., retires from his position to-day (Saturday). He has been with Lever's since 1921, when he became the first general service manager. Previously, he had held an appointment under Lord Weir with the Ministry of Munitions.

SPEAKING AT THE LEAGUE OF INDUSTRY CONFERENCE, BUXTON, last Saturday, Mr. Frank Hodges, in opposing a resolution protesting against the imported fuel oil tax, stated that it was his belief that within ten years this country would be able, out of its own coal resources, to produce all the oils and motor spirit it needed.

THE PROSPECTUS OF UNIVERSITY COURSES in the Municipal College of Technology, Manchester, has been published for the 1933-34 session. A full-time course in chemical engineering, extending over three years, has been arranged in the department of applied chemistry. Particulars of this course may be obtained from the registrar.

SOME OF THE NEW FACTORIES which have been established in Ireland for the packing of chemical products may experience difficulties, since the inception of the Free State packet tax, which followed the decision of Dublin packers and fillers to organise. It is understood that they will demand a forty-four hour week, a minimum wage standard, payment for Bank Holidays and a week's annual leave.

COAL DISTILLATION AND BY-PRODUCTS OF NEW ZEALAND, LTD., have asked the Prime Minister, Mr. Forbes, to create facilities for a £600,000 oil from coal scheme by giving an assurance that no excise duty should be levied on home produced motor spirit during the next five years. Details of the scheme will be submitted for consideration by the Cabinet. The capital for the enterprise is stated to be available in London.

ACCORDING TO "THE NORTHERN MINER" (Toronto), the Base Metals Mining Corp. of Canada (in which the Mining Corp. of Canada holds a considerable interest) commenced the operation of its mill at Field, B.C., during the second week of August at half capacity. A total of 1,083 tons of ore were milled during the first week, the grade being 18.9 per cent. lead, 11.7 per cent. zinc with additional values in silver. From this run, 300 tons of lead and 250 tons of zinc concentrates were produced and despatched to Vancouver.

MR. R. M. HUGHES, of the staff of Imperial Chemical Industries, Ltd., died at Calcutta on October 1 after a short illness.

MEMBERS OF THE INSTITUTION OF CHEMICAL ENGINEERS are asked to note that the date of the President's reception has been changed from November 16 to Wednesday, November 22.

A LARGE QUANTITY OF CHEMICAL MATERIALS was destroyed as the result of a fire in the premises of Davidson and Gray, Ltd., 128 Nethergate, Dundee, which occurred last week.

AN IMPORT DUTY of 7s. 6d. per gallon (Imperial Preferential rate 5s. per gallon) has been imposed on liquid driers for paints and varnishes or mixtures thereof entering the Irish Free State, operative from September 30.

OLIVER ASHWORTH AND CO., Bury, Lancs., have just published their third autumn catalogue. It comprises a complete list of textile plant and machinery for sale in connection with their recent purchase of the Bury and Heap Commercial Co., Ltd.

A PLANT FOR MANUFACTURING IODINE from seaweed is announced to have commenced operation at Archangelsk (Northern Russia). Iodine is also reported as being manufactured at Tschussowskie Gorodki in the Urals, but details of the nature of the raw material are lacking.

UNDER THE TERMS OF A CONTRACT drawn up at the close of last month between the Roumanian Government and I. G. Farbenindustrie, the latter are to export chemicals and by-products to Roumania to the value of about £1,000,000, and to import agricultural produce from Roumania to a value of about £1,250,000.

EXCEPTIONAL TRANSPARENCY to short wave light is claimed for glasses in which the usual proportion of silicic acid is wholly or partially replaced by aluminium phosphate or its components in the ratio of (2) SiO₂ : (1) AlPO₄. An article on this subject is published in "Chemiker-Zeitung," September 30, 1933, page 776.

THE OFFICIAL ANNOUNCEMENT BY PEASE AND PARTNERS, LTD., of the appointment of Mr. Andrew Whyte to the post of general manager was made last Saturday. He is also a director of the Lancashire Steel Corporation, but it is understood that he will relinquish his duties in that capacity.

NEOSALVARSAN, states a report in the "Chemische Fabrik," September 27, will now be manufactured at Klausenburg, by Egger and Co., who have acquired the manufacturing rights for Roumania by a Polish process. At present Neosalvarsan is imported into Roumania to the value of 100,000,000 lei (about £164,000) per annum.

THE FOUNDATION STONE OF A NEW TECHNICAL COLLEGE for Dudley was laid on Wednesday by Mr. H. A. L. Fisher, a former President of the Board of Education. It is being jointly erected by Dudley and Staffordshire education committees. In his opening speech Mr. Fisher said that the success of the college would depend upon the attitude of the neighbouring industries to it.

APPLICATION FOR LICENCES under the Dyestuffs (Import Regulation) Act, 1920, during September, totalled 657, of which 543 were from merchants or importers; to these should be added the six cases outstanding on August 31. Of this total 646 were granted, nine were referred to British makers of similar products and eight were left outstanding on September 30.

THERE WAS AN INCREASE IN THE VALUE OF CHEMICALS imported into the Irish Free State during August, the total being £85,102, as compared with £71,002 in the corresponding period last year. Imports of chemical fertilisers declined, however, from £41,639 in August, 1932, to £10,922 in the month under review owing to the heavy tariffs imposed.

THE SOCIETY OF CHEMICAL INDUSTRY has, with a view to bringing younger members of the profession into touch with the Society's work, established a new form of associate membership to take the place of all existing forms of junior associateship. Existing associates may continue under the old arrangements or transfer to the new class. The subscription is 7s. 6d. per annum, and the age limit 23.

PLANS FOR A FURTHER EXTENSION of the Monsanto Chemical Works, Cefn Mawr, Denbighshire, have been decided on. It will be necessary to divert a road in order that a £250,000 scheme may be carried out. When the extensions are completed the firm's employees will have to be considerably augmented. The opening of the new power plant by Prince George is reported in another page.

DETAILS OF THE SELECTIVE GAS ADSORPTIVE CAPACITY of various types of prepared carbon, as well as of silica gel, are published in "Zeitschrift f. tech. Physik," 1933, page 319. It appears that hydrogen is only absorbed to a very moderate extent by silica gel. Since the latter equals activated coconut charcoal in its adsorptive capacity for nitrogen, a new method is indicated for separating hydrogen from gaseous mixtures.

PEOPLE LIVING AT DENBY DALE, Yorkshire, have complained to the local authorities that the water supplied from the mains turns food black. The clerk to the local council stated that this was due to over chlorination of the water, which in this case was so excessive as to necessitate de-chlorination before the water was fit for drinking purposes. An American method had proved a failure, and now sanction was being sought for the erection of a large storage tank in which the chlorine would be allowed to evaporate.

REPRESENTATION HAS BEEN MADE to the Board of Trade under Section 10 (5) of the Finance Act, 1926, for the exemption of "apparatus for measuring carbon dioxide evolved during fermentation" from Key Industry Duty under Section 1 of the Safeguarding of Industries Act, 1921, as amended by the 1926 Act. The ground of the representation is that the apparatus is not made, and is not likely to be made, in any of the British Dominions in substantial quantities, having regard to the requirements of the United Kingdom. Communications on the subject should be addressed to the Principal Assistant Secretary, Industries and Manufactures Department, Board of Trade, Great George Street, S.W.1, not later than October 27.

Mr. K. S. MURRAY, chairman and managing director of the British Oxygen Co., Ltd., will resign his appointments at the end of the year. In an appreciation of Mr. Murray, the secretary of the firm writes that he has contemplated this step for some years, but delayed taking it until the reorganisation of the business, necessitated by amalgamations, had been completed. At the annual meeting last May, Mr. Sharp, a director, said that when the company was known as Brins Oxygen Co. formed by two brothers named Brin to operate a process for abstracting oxygen from the atmosphere by means of barium, tests failed to show any result. The actual success of the barium process was due to Mr. Murray personally. "I want to claim for Mr. Murray the title of 'the man who has made oxygen a commercial product,'" he said.

SEVERAL NEW ENTERPRISES ON TEES-SIDE are reported by the Tees District Development Board in their first news bulletin, issued recently. Among the most important are the manufacture of special alloy steels for the motor industry by the South Durham Iron and Steel Co. and "chromador," a new high grade steel which Dorman, Long will use in the construction of the Storstrom bridge, Denmark, and in other works for the construction of which they hold contracts. Richard Hill & Co., Ltd., Middlesbrough, have started the manufacture of "steeltext," which they claim is invaluable for building purposes as it makes a crackless interior plaster finish possible. The new factories at Billingham of Imperial Chemical Industries, Ltd., and British Titan Products, Ltd., are also mentioned. An attractive brochure, printed in three languages, with illustrations of new works in the district, is also included in the Board's news service.

IT WAS ANNOUNCED LAST WEEK by the directors of the Branstons Artificial Silk Co., Ltd., that by the sale of a number of shares held in Kirklees, Ltd., the disposal of part of the property regarded as superfluous, and from note subscriptions and loans, the firm's indebtedness to the Alliance Assurance Co., Ltd., has been met. A technical expert is reporting on the position, and in due course plans for the future will be laid before the shareholders.

AN ORDER ISSUED BY THE TREASURY on Wednesday, October 4, puts in operation for twelve months a scheme for the allowance of drawback of Customs duties in respect of slabs of stainless steel of a certain quality used in the manufacture of stainless steel sheets. Slabs of steel of this quality are forwarded to this country by a Continental firm of melters for rolling into sheets of various sizes and thicknesses, as they are unable themselves to carry out the specialised process involved. There is no change in the ownership of the steel, which, after rolling, is returned to the firm from which it was received.

A SEARCH FOR NEW USES FOR COCONUT FIBRE is suggested by Dr. S. G. Barker in a report on the subject issued by the Empire Marketing Board (E.M.B. 71, price 1s.). He states that in 1931 three and a half million tons of coir for spinning were produced, but only 100,000 tons were used. The industry as at present carried out in India is on a cottage basis, but it should be possible to introduce retting on a factory basis for large quantities and by chemical methods. Coir properly treated by mechanical and chemical processes is more resistant to decay and bacteria. Dr. Barker also describes experimental treatments of fibre which he has found to be successful.

Castor Oil Products for Lacquer

THE outstanding features of castor oil products in relation to lacquer are dealt with in a new brochure issued by Rex Campbell and Co., Ltd. These products have excellent plasticising properties some of which are unique. They combine readily with synthetic plasticisers to produce a blend suitable for all purposes. They also make excellent grinding mediums for pigments and stand up well to exterior exposure without darkening. In addition to these useful properties they are low in price. Three grades are available—"Crex first pressings" is a good all round plasticiser for general use and extra pale in colour; "Crex prime blown" is used where increased body is required with extra tough film; "Plastrol" is a specially treated oil with greatly improved properties and contains all the advantages of castor oil without its disadvantages. This last named product being more compatible with nitro cellulose, produces films of greater adhesion gloss and elasticity, and is therefore, recommended for cellulose solutions used on leather and leather cloth.

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